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MARCH 1970

The Florida Magazine for all Sportsmen

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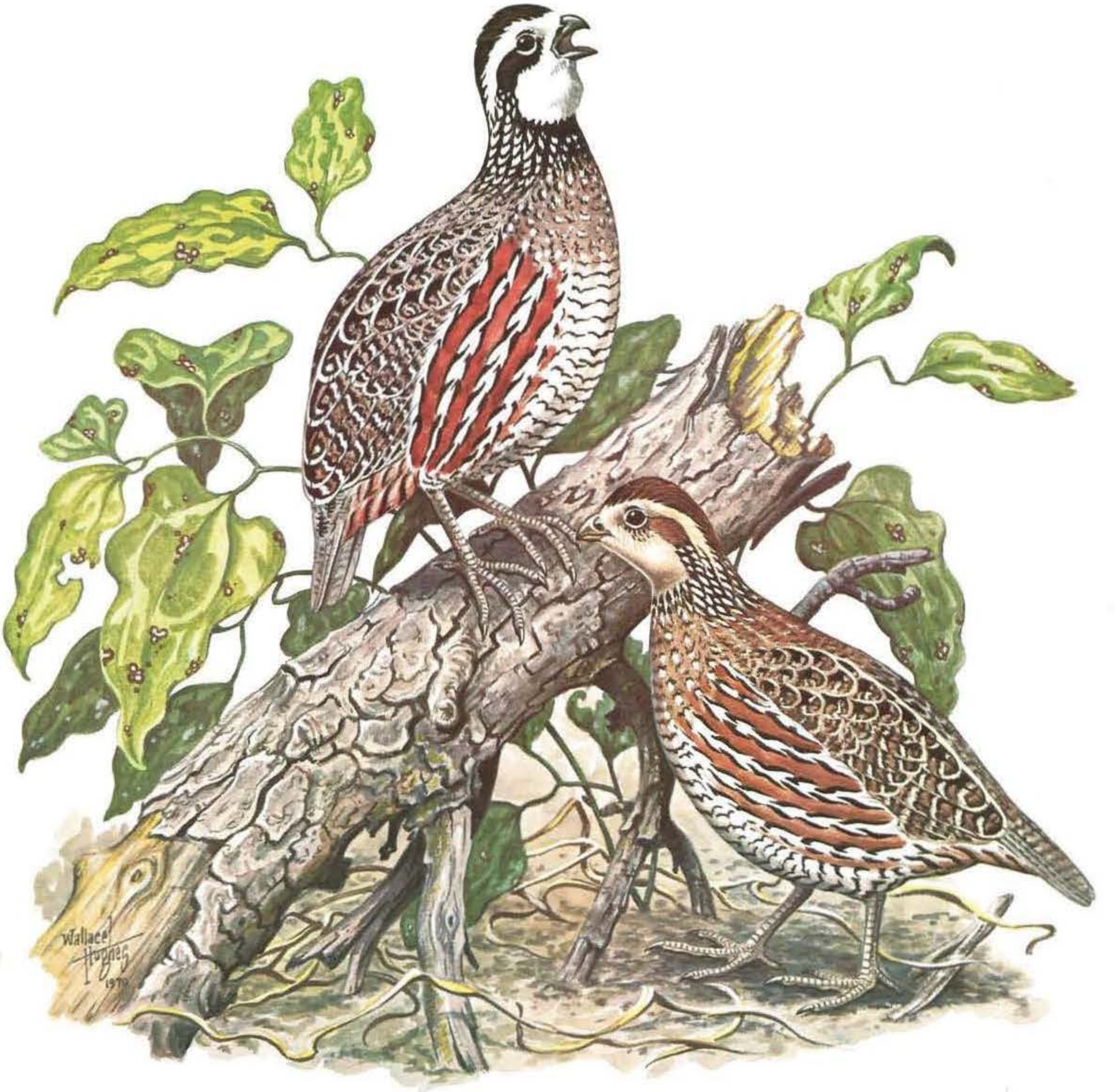
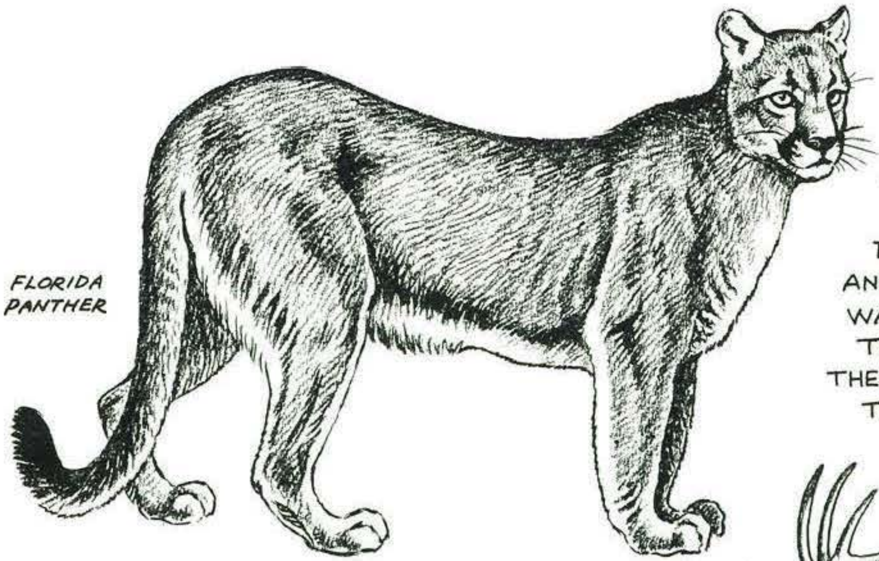


Florida Wildlife Scrapbook

NATURE NOTES



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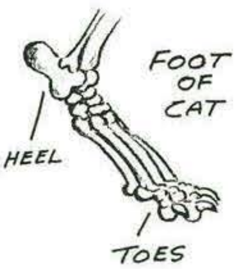
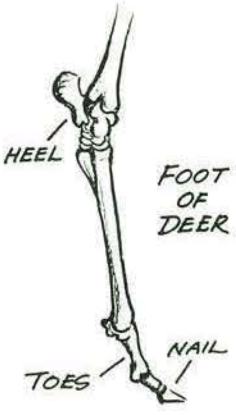
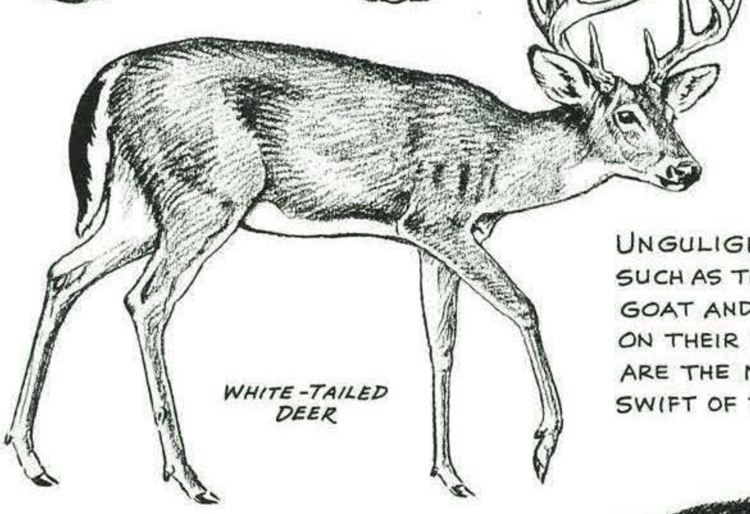
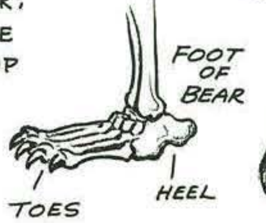






UNGULIGRADE ANIMALS SUCH AS THE DEER, HORSE, GOAT AND ANTELOPE WALK ON THEIR TOENAILS • THEY ARE THE MOST AGILE AND SWIFT OF THE THREE GROUPS

PLANTIGRADE ANIMALS WALK FLAT-FOOTED WITH TOES AND HEELS ON THE GROUND • THE BEAR, RACCOON, BEAVER, SKUNK, BADGER AND PORCUPINE BELONG TO THIS GROUP



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Florida WILDLIFE

Vol. 23, No. 10

MARCH 1970

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State of Florida

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Publications Department

BILL HANSEN *Editor*
WALLACE HUGHES *Art Director*
GENE SMITH *Editorial Assistant*
C. L. SATTERFIELD *Circulation*

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The Cover

It happens every spring—"covey breakup" time for Bobwhite Quail, and both the male, above, and egg-laying hen will soon be equally protecting their average clutch of 14 eggs. See page 13.

From A Painting By Wallace Hughes

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The theme for "Ladies of the Lakes" is pollution prevention—which costs nothing; eliminates need for expensive cleanup. Now, through Florida congressmen, they hope to see emergency congressional action to save public lakes located in all states.

a clean, tranquil fresh water lake is priceless

Save our Lakes

By **GENE SMITH**

"THEY SAID it couldn't be done!"

Who knows with what inner satisfaction that overworked line has been breathed by persevering men and women, past and present, who have accomplished some "impossible" feat or invented some improbable machine! History is full of their deeds.

Overlooked sometimes in the march of science and technology are the attainments—on behalf of us all—of ordinary citizens who, through their initiative and resourcefulness, occasionally hang up big wins that affect people almost as profoundly as has the invention of the airplane and the time payment plan.

Two vivacious Florida ladies have made such a mark. They have gained a victory for water conservation and human survival that few supporters, including their husbands, thought at the outset they could fully achieve. But they did it—without money and without the aid of any prestigious conservation club or association—in less than two years.

Mrs. Joe E. Romano, 7410 W. Tropicana Street, Miramar, Florida 33023, and Mrs. Jack Obermeyer of 7431 W. Tropicana are now widely known as "The Ladies of the Lakes." They have waged a unique people's campaign to "Save Florida Lakes."

On February 3, 1970, they watched in the state capitol at Tallahassee as Governor Claude R. Kirk, Jr., signed an executive order *they had drafted* setting aside all of Florida's state-owned fresh water lakes "to be preserved in their natural condition, pristine, attractive, useful and enjoyable," as sources of drinking water and for recreation, for the perpetual benefit of both residents and guests of the Sunshine State.

At the same time, Governor Kirk and the cabinet members, sitting as The Trustees of the Internal Improvement Trust Fund (who administer all state-owned lands and waters held in public trust), signed an emergency resolution guaranteeing the sanctity of the remaining public lakes against dredging and filling below their mean high water lines, against sale by the state, and against further degradation of their waters by pollution.

The signing came in the 458th year of Florida's recorded history. It was a "first." It was purely the result of a spontaneous movement spearheaded by "The Ladies of the Lakes."

In early 1968 they had read in FLORIDA WILDLIFE ("This Land Is Yours," by Larry Shanks, March '68 issue) about the great danger to the few publicly-owned lakes from *illegal* dredging and filling which destroys fish and wildlife habitat, reduces water quality, and lessens the recreational and scenic values of our lakes.

Soon the ladies were thinking about *legal* alterations of priceless lakes, too, and the irreversible damage *approved* dredging does to them, often "justified" under the guise of "progress." They decided something should be done to protect all Florida lakes, but particularly those in public ownership and especially those still free, or reasonably free, of pollution.

The "Save the Lakes" campaign didn't really get rolling, however, until the Romanos became waterfront property owners on Lake McCoy, a meandered, publicly-owned lake in Highlands County—with water so pure it could be drunk with the assurance that it was cleaner and healthier than most tap water in south Florida cities, they pointed out.

The pivotal point in the campaign story was the ladies' successful fight to persuade the State Department of Transportation to alter its plans for widening U.S. Highway 27 because the original route would have caused Lake McCoy to be partially filled.

That was in late 1969.

Two housewives and mothers, backed by biological opinion and massive public support—through mail, signed petitions, and attendance at public hearings—gained rerouting of the highway and saved Lake McCoy from certain damage.

The Department of Transportation subsequently accepted further recommendations of fishery biologists of the Game and Fresh Water Fish Commission and established a bulkhead line in the alternate plan which would further reduce the danger of damage to the shoreline of the 56-acre lake.

The rest of the "Lakes" story is fairly well known.

With the encouragement of Commission officials, with wide newspaper and television coverage of their feat, and with their remarkable grasp of water conservation problems—with all that "going for them," plus fantastic response in support of their campaign, the ladies began to broaden their perspective.

From Lake McCoy they successfully moved to gain the protection of government for *all* remaining public lakes, the "impossible dream" which cul-

(*Continued on next page*)

EXECUTIVE ORDER
RESOLUTION

For the People of the State of Florida For Their Survival

WHEREAS, the citizens of the State of Florida and their neighboring states need drinking water to survive; and

WHEREAS, there are 257 state-owned lakes at this time and any others as they become state-owned that belong to all the people, containing said water; and

WHEREAS, there are only few remaining of good quality; and

WHEREAS, with this guarantee that from this date, February 3, 1970 forward, no further damage or risk to the present water quality of these lakes will occur and that no further degradation to the water quality or lakes will be permitted and that these lakes will not fall prey to further encroachment and there will be no further selling of these lakes which belong to all the people, or new permits granted or old permits validated or rights-of-way or easements granted as affects these 257 lakes, that in the public interest precedence be in this same instance, the water of these lakes remain for drinking for survival of our people. That no other instance, County, State Agency, Private or Public enterprise as relates to this be acknowledged or granted or take precedence as being in the public interest. That this resolution protect for the people these lakes from further contradictory acts or legislation over which the executive branch of Florida's government has control as relates to this emergency action resolution. That the bulkhead lines be determined as the mean high water line according to E. W. Bishop's recommendation as stated in the 1967 edition exclusively of Florida Lakes, Part 1 &2, all parties concerned are satisfied with these techniques established on said date for the best protection of these lakes and accepted and recommended by the Game and Fresh Water Fish Commission, plus other valid biological and hydrographic information; and

WHEREAS, the State of Florida does take emergency action now to hereby set these 257 lakes aside for our water supply for ourselves and future generations as well as for recreational benefits, fishing, swimming, boating, water skiing and natural scenic beauty; and

WHEREAS, be it further resolved that we should utilize our God-given lakes, our natural assets intended for man's benefit instead of destroying them. Do not destroy what we as Floridians cherish, more than that, these lakes are our Life Blood!

NOW, THEREFORE, I, Claude R. Kirk, Jr., by virtue of the authority vested in me as Governor of the State of Florida, do hereby set these lakes aside to be preserved in their natural condition, pristine, attractive, useful and enjoyable for Floridians and tourists.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of Florida to be affixed at Tallahassee, the Capital, [SEAL] this 3rd day of February in the year of our Lord nineteen hundred and seventy and in the recorded history of Florida four hundred and fifty-eight.

/s/ Claude R. Kirk, Jr.
GOVERNOR

ATTEST:
/s/ Tom Adams
SECRETARY OF STATE

(*Continued from preceding page*)

minated in two separate appearances before Governor Kirk and the cabinet and the signing of the emergency resolution and executive order in February.

Now, with support and recognition from all 50 states and a number of foreign countries, and national publicity for their Florida campaign, "The Ladies of the Lakes" are "shooting for the other 49!"

They are still receiving mail, and beginning to fill requests for detailed information on how they organized their effort, from various citizens' groups around the country.

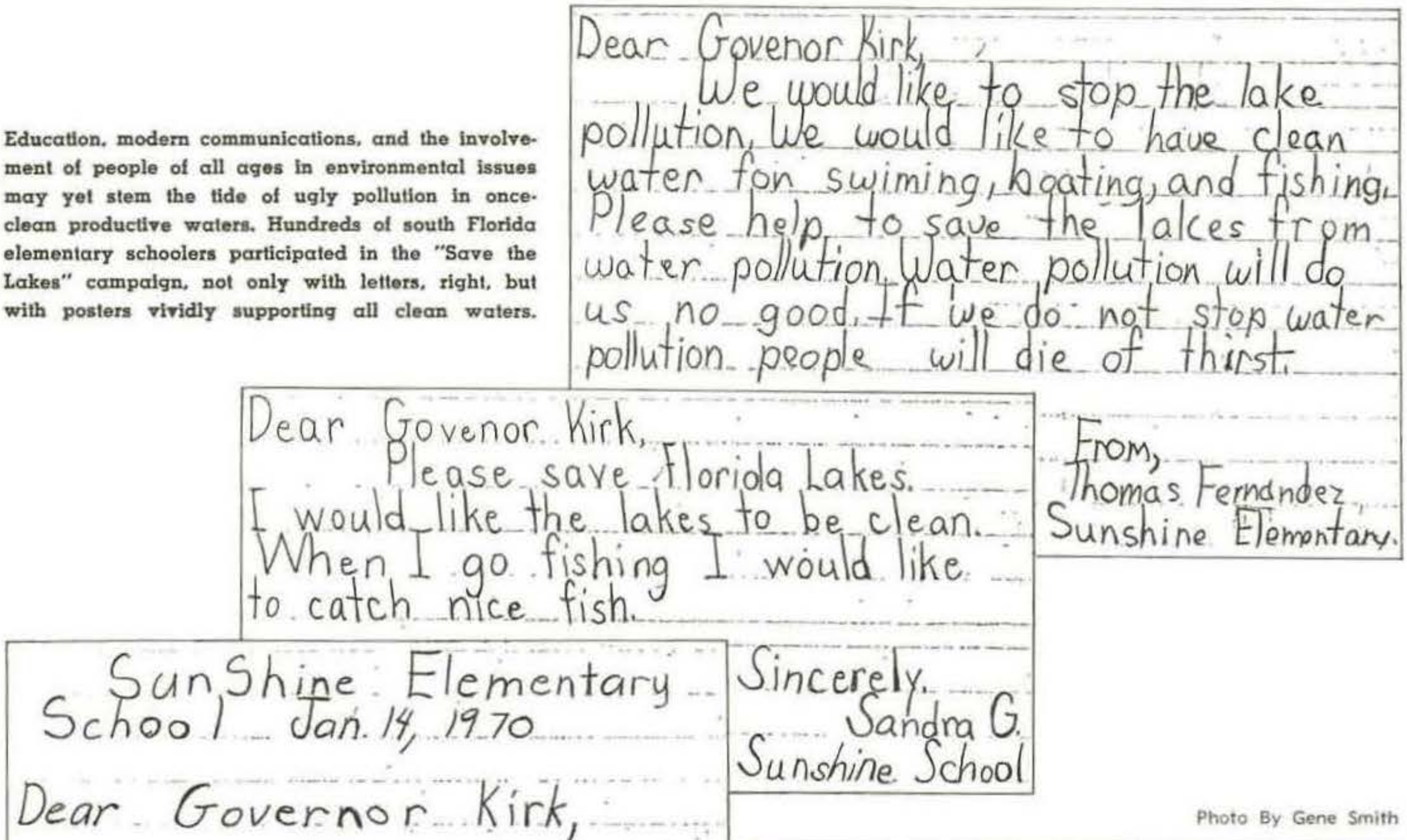
They are hoping, too, and believe it will come to pass, that emergency congressional action similar to state action already taken in Florida will help save public waters throughout the nation from the encroachment of men, machines, and pollution.

They explain, "As people throughout the nation responded to help Floridians, we, in turn, wish to make the same protection available to them in their states; to show how people all together, with the cooperation of government and without spending money, can prevent many water pollution problems from occurring."

After all, as Vickie Romano and Dorothy Obermeyer have said repeatedly, clean water *is* a matter of survival.

What issue could be more important or more worthy of support? ●

Education, modern communications, and the involvement of people of all ages in environmental issues may yet stem the tide of ugly pollution in once-clean productive waters. Hundreds of south Florida elementary schoolers participated in the "Save the Lakes" campaign, not only with letters, right, but with posters vividly supporting all clean waters.



Dear Govenor Kirk,
We would like to stop the lake pollution, We would like to have clean water fon swiming, boating, and fishing. Please help to save the lakes from water pollution Water pollution will do us no good. If we do not stop water pollution people will die of thirst.

From,
Thomas Fernandez,
Sunshine Elementary.

Dear Govenor Kirk,
Please save Florida Lakes. I would like the lakes to be clean. When I go fishing I would like to catch nice fish.

Sincerely.
Sandra G.
Sunshine School

SunShine Elementary
School Jan. 14, 1970

Dear Governor Kirk,

We think our lakes are polutied. We Can't go fishing or Swiming. The animals Can't drink in will die Keep our lakes clean.
A Stadent Carole

Photo By Gene Smith

Tackle Talk

anglers should give considerable thought to their "gear," whether it's rods and reels for good handling, or lures and hooks for landing fish

By CHARLES WATERMAN

A LOT OF FISHING tackle is sold because of the way it feels and looks. A tricky rod handle that feels good can make up for highly inferior performance by the business end of the outfit. The guys in charge of sales are often interested in sleek appearance and feel rather than in rod action. I don't really blame them because the stuff has to be sold.

But the way the thing feels also has a lot to do with whether you get tired using it or not. You might as well do it the easy way if possible. If you look around at your gear you're likely to find something that makes your fingers sore or your wrist ache. I have an excellent baitcasting reel with a streamlined appearance and very smooth action—but the side plate is so sharp at the edges it makes your palm sore when you cup your left hand around it to retrieve. I simply don't use it.

Many open-faced spinning outfits are balanced so that the fingers of the rod-holding hand take a beating as they are clamped over the reel seat. It is always good for a snicker to note that expensive spinning rods generally have beautifully designed cork grips that are seldom touched by the hand, which is clamped around metal all of the time.

Ed Miller of Tallahassee got on a history kick a while back and got to studying some of the very old and heavy salt water reels. They were conventional turning spool reels but, instead of being mounted on top of the rod, they were mounted underneath. That way you didn't have to hold the thing balanced on top of the rod all of the time. Well, why not? Of course the downstairs reel wouldn't work if you were using the outfit for casting. The probable explanation is that fishermen began casting with their reels, had to have them on top, and wanted the trolling reels to handle the same way.

One of the most restful things about a plugging reel is that most of us cast with the right hand, then hold the rod in the left while we wind with the right—a little change-off on every cast that's very restful. Of course the most efficient way is to cast with one hand and wind with the other, but you'd never let loose of the rig that way and your pinky tends to cramp after a few hours. The most tiring thing about open-faced spinning reels is that you seldom change your hold on the outfit, during casting, retrieving or fish playing.

A lot of good fly fishermen view me with condescension because I cast with my right hand and have my reel handle on the right side, which means I have to change hands any time I turn the crank. They go for the efficient method of having the reel handle on the left side so that it's always available to the free hand. This is also more natural for longtime spin-fishermen who are used to winding with their left hands.

Well now it's a small thing but I went to the right hand wind after years with the other kind, simply because I thought it was restful to change

(*Continued on next page*)

Setting the hook on a little tarpon like this one can be very difficult until you get the hang of it. Then it becomes a rather simple matter.

(*Continued from preceding page*)

hands now and then. Also, most reels were made to wind with the right hand.

This may be a little freakish but I know two long-time fly fishermen who have their reels mounted so that they crank *backward* on the retrieve. They say they got started at that when they wanted the handle on the left side and happened to have right-hand-wind fly reels. Now they prefer it like that; you know, you turn the handle back toward yourself rather than away from you. For me, it's like backing down a freeway. Quite a few spin fishermen put their open-faced reels up on top of the rod on the retrieve and crank it what I think is the wrong way. Have I lost you? I sure lost me.

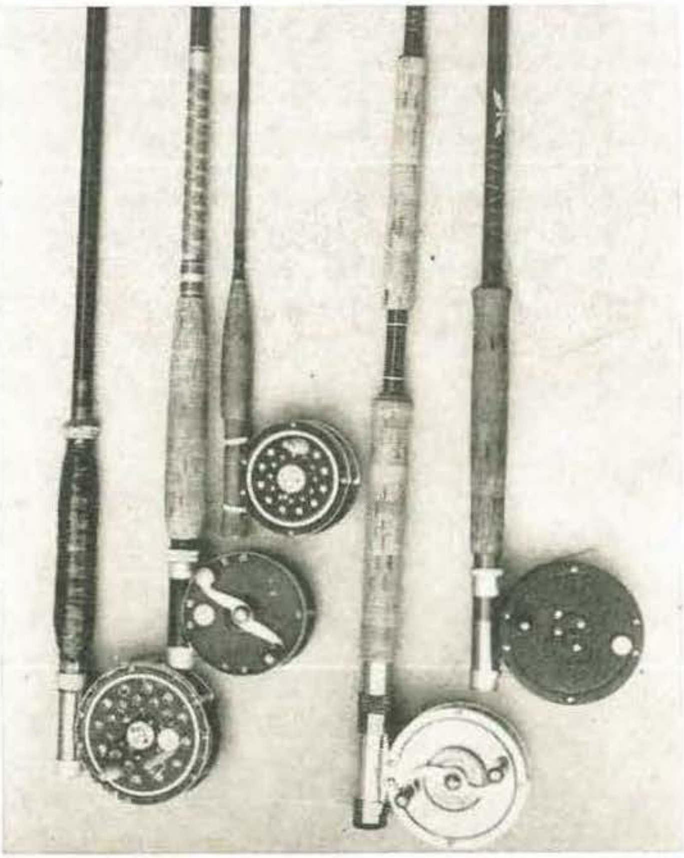
I have a custom-made plugging rod, made quite stiff for salt water fishing, and really one of the nicest I ever owned. But they made the finger hook sharp enough to slice cabbage, and by the time I get it taped up so I can hang on without losing my forefinger, the rod looks like walking wounded.

Through the years they have failed to come up with anything that feels better than high grade cork for rod handles. Cork doesn't get slippery very easily. Actual fish slime or a lot of grease can make it a little slick, but that can usually be avoided.

Shapes of rod handles have ranged from the true hammer handle contour, which must be carefully hand formed and is found only on customized outfits, to delicate cigar-shaped grips. I decided long ago that the extra small grip is more tiring than something which fills my hand fairly well, even though the tiny handle has a lot of appeal when first grabbed. I believe the idea is the same as that in steering wheels. Although steering wheel grips on easily steered family cars are likely to be pretty small in cross-section, most trucks and racing cars have quite a bit to hang on to.

If a rod handle is made to fit your hand exactly, it probably wouldn't fit anybody else's, so most builders compromise. Some casting rods have handles that taper toward the butt and this feels fine as long as there's a finger hook, but is hard to hang to if there's no finger hook. There used to be quite a number of casting rods with just a ridge of cork for the forefinger to hold to. I never liked it as well as a finger hook. Very few rods of any kind are actually thrown out of boats or off piers so people must hang on pretty well.

IF YOU FISH with flies where it's sometimes necessary to strip off line fast, be sure your reel has enough drag to prevent overruns. A while back, trying out a new reel with a very light drag-click setup, I saw a fish strike some distance out and tried to get to him in a hurry. As usual, I yanked the line off the reel as fast as I could with my left hand without taking my eye off the spot I hoped to cast. The operation came to a shuddering halt, and I learned that I had backlashed the outfit so badly that it had to be disassembled before I could go on fishing. A simple case of spinning the reel so hard that the drag didn't keep it from rolling faster than the line came off.



There are many good rod shapes, but the handles that get hard use should be fairly full. The one at far left has been padded out with tape. The little handle in the center is on light duty rod, and serves well in small size.

I'M ALL WORKED UP over a book written by Bob Elman, a New York editor and sportsman, who has been associated with outdoor publications for some years. Elman's latest book is DISCOVER THE OUTDOORS, and is written for families who are interested in what goes on outside. Although it is aimed primarily at young people, it is worthwhile as a basic source for anyone who wants to start camping, fishing or hunting.

Now there is a need for this kind of dope. Those of you who read the rabid wanderings of fishing nuts or hunting nuts of my ilk might feel it is a little general in coverage—but that is the idea. The average youngster who wants to find out what fishing, camping and hunting are about would be lost in the technical discussions of outdoor columnists who are aiming at hunters and fishermen of long standing. A good analogy would be the situation of a kid who had no knowledge of American athletics and endeavored to attack a newspaper sports page. He wouldn't even understand the headlines.

Elman has the conservation theme strongly implanted in his book but he doesn't preach—just slides it in the way it appears to anyone who camps, hunts or fishes. Any kid (or adult) who goes through this work should get the idea painlessly. In addition to being pleasant reading, the book would make an excellent school text. As required reading in high school, say, it would give background that everybody should have, whether he goes outdoors or not. I am enthusiastic about it and anyone who has labored through my meanderings for long knows that I don't get enthusiastic over many books, having a built-in jealousy of all outdoor authors.

The cost is $5.95. That's The Lion Press, Inc. 21 West 38th St., New York, N.Y. 10018. Your book dealer could get it. It's beautifully illustrated with authentic photography, both black and white and color.

After all this, they should send me a commission.

THE QUALITY of hooks, especially those used in salt water, is a subject of considerable beefing on the part of fishermen who see them rusting away from expensive lures and flies. Most of us can't tell much about hooks by just looking at them anyway and we are burned to find that some manufacturer has tried to save half a cent on a thing that costs almost two bucks.

Generally it's simply an effort at cutting corners but there are some cases where the best hook is the worst. Take some popping bugs my wife made. They are primarily intended for salt water, have rather long, slender bodies and long feather or bucktail tails. They cast well and catch fish, but one of their best features is that they sit up high on the water and are easily picked up for casting. They also make noisy pops when wanted—and they can work as "sliders" and make very little fuss at all. The "secret" about these features is that they use cheap, light-wire hooks. If they had good, heavy hooks they'd sit lower in the water, be harder to cast and have much less versatility.

Of course the hooks don't last well. They'll rust away fast and can be bent with your fingers. They would be completely impractical for commercially produced lures. If you make them yourself and are willing to chuck them after a couple of trips they're a good idea.

I DON'T KNOW how big mudfish (bowfin) get. Far as I know there have been no accurate records kept, which is usually the case with nongame fish. I have seen some big ones but haven't weighed many.

J. S. Howard of 2640 Peeler Road, Doraville, Georgia 30340, wrote me an interesting letter about a recent claim of a world record from Lake Talquin. That one weighed 16½ pounds. Mr. Howard says he's heard of lots of fish bigger than that. The biggest one he's heard of was a 23-pounder out of Lake Hatchineha. And Mr. Howard deplores the fact that there is no agency that keeps complete records. He's right, of course, and since there are few contests for nongame fish, there's very little accurate information about them. For example, the 23-pounder was probably weighed and thrown away since there was no contest form to fill out.

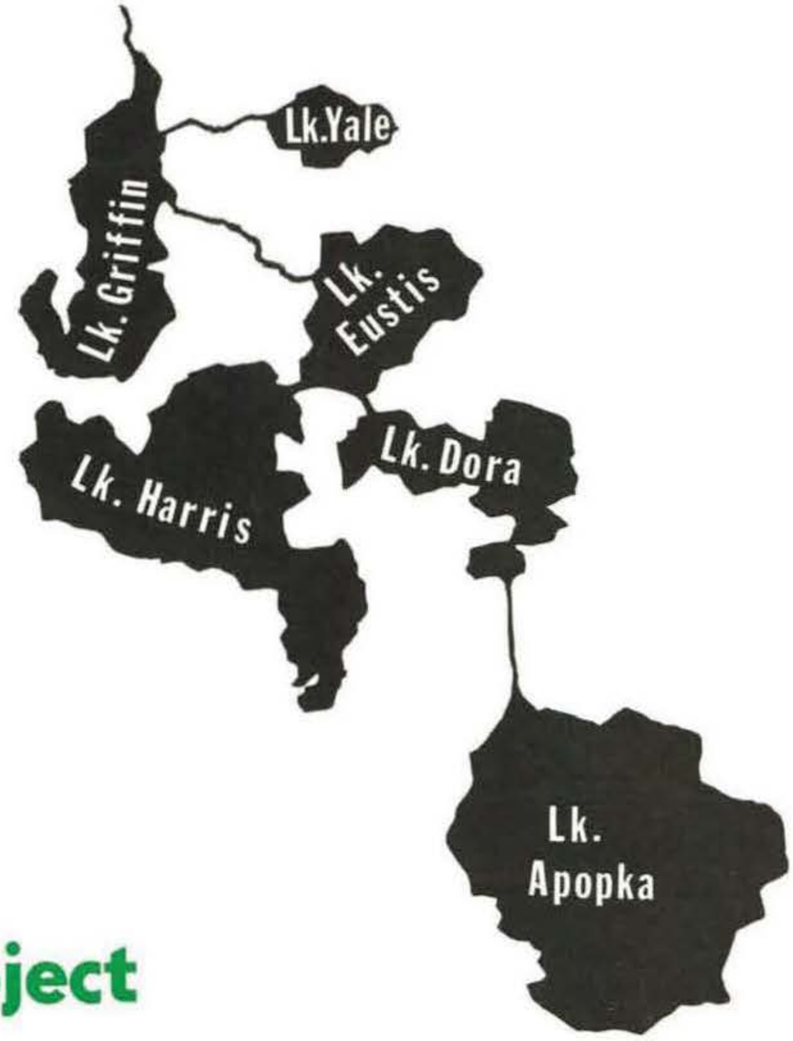
Mr. Howard, who had some interest in big bowfins, has been checking with various fishing resorts and hears all sorts of reports of big mudfish. Of course, Mr. Howard, like anyone else, can't produce much documentary evidence. He suggests that we should have some central agency for the purpose of keeping records—such as the Boone & Crockett Club that keeps big game scores.

The trouble is that there's no one to support such an organization. Now the International Game Fish Association handles salt water records, but they have their own rules and their own classifications. Their rules eliminate the use of some very sporting methods. The Salt Water Fly-Rodders have their records; so has the International Spin-Fishing Association (I think I have that name right). Then, there's the FIELD & STREAM contest which has been accepted as the final authority in some kinds of fishing. As Mr. Howard feels, the record business is pretty badly fouled up. ●

There's question as to just how big a mudfish gets. This is a peewee compared to some of the whoppers, but proved a task to land on light spinning tackle.

By FRED WALDINGER, Biologist

Department of Air & Water Pollution Control



the Lake Apopka and Oklawaha River Basin Restoration Project

THE OKLAWAHA RIVER drainage basin originates about 10 miles north of the city of Orlando and terminates in the St. Johns River. This basin, which forms the largest single tributary of the St. Johns, incorporates seven major central Florida lakes: Apopka, Beauclair, Dora, Harris, Eustis, Yale, and Griffin. Two of these lakes, Harris and Yale, flow into the basin and do not receive any preceding waters of the system.

Gourd Neck Springs, located at the extreme southwestern end of Lake Apopka, can be considered the headwaters of the Oklawaha basin. Waters in this system generally flow in a northerly direction. Lake Apopka drains to Lake Beauclair via a manmade canal, the Apopka-Beauclair Canal. Lake Beauclair empties almost directly into Lake Dora, which, in turn, drains into Lake Eustis through the Dora Canal. Lake Harris' waters also empty into Lake Eustis by way of the Dead River. Water leaving Lake Eustis flows through Haines Creek into Lake Griffin, which drains directly into the Oklawaha River. Lake Yale is connected with Lake Griffin by another manmade canal, the Yale Canal.

Lake Apopka really needs no introduction to most readers. Over the years this lake has entertained a notorious reputation for one reason or another. Historically, Lake Apopka was renowned as an excellent sport fishing lake. Its famed bass fishing supported a multimillion dollar recreational resource for the people of the state of Florida. More recently, the lake has acquired an infamous character because of its poor, almost nonexistent sport fishery and its extremely unattractive qualities as the result of massive algal "bloom," which turns the water a pea soup green. It can be said that, aesthetically, Lake Apopka stinks!

The remainder of the downstream chain of lakes in the Oklawaha basin, when reviewed, do not brighten the gloomy situation. Lakes Beauclair, Dora, and Eustis, for all practical purposes, are as unproductive in their sport fisheries and as unattractive as Lake Apopka. If Lakes Harris and Yale are excluded from this discussion, (as they should be, because of the manner in which they flow into the basin system) then Lake Griffin, the last lake in the chain, is the only one that today really supports a sport fishery in the Oklawaha basin. However, the recreational assets of Lake Griffin will be short-lived because of the increasing degradation pressures that affect this water resource.

The restoration programs for all of the lakes in the Oklawaha basin are not definitive at this time. Knowledge, time, and money are the three essential ingredients necessary to formulate such plans. It is the state's intention to restore all waters in this basin to a degree to which they can be once again considered a useful and valuable resource to the people of Florida. The Lake Apopka Restoration Plan, however, is a reality, and the following information will, hopefully, explain the intent of this program and subsequently answer the various questions that have arisen, or might arise, on this subject.

The problems associated with the degradation of Lake Apopka and the whole of the Oklawaha basin are related to the *eutrophication* process that has been occurring in these waters since their creation. This process can be defined briefly as the changing of a lake from a nonproductive to a very productive state resulting in the death of that lake. This is a normal process, occurring worldwide, and generally referred to as the aging of a body of water. Aging, or overenrichment—eutrophication—is brought about by the addition of nutrients (fertilizers), which is, as we know, greatly accelerated by man's activities.

The adverse conditions existing in Lake Apopka and the downstream chain of lakes did not occur overnight. Their conditions relate the results of artificial overenrichment during the past 25 years. However, if man's activities had not affected these lakes, then 25 years would be a negligible time period when compared to the thousands of years that would be required to age these lakes to the same state under natural conditions.

In 1948 the Apopka-Beauclair Canal was opened, and in 1952 a control structure was installed. From that point on, the lake became a biologically mismanaged reservoir. Lake drawdown (lowering of the water level) for fish management was ignored. The surrounding muck farms pumped excess water from their fertilized fields into the lake. Untreated citrus processing wastes and sewage effluents continued to be emptied into the lake. Unknown acreages of water hyacinths were sprayed and left to decompose. And the abuses continued.

When the nutrient load entering the lake exceeded the assimilation capacity of that water body (a point where the aquatic habitat diverged from a well-balanced biological community), then the excessive fertilization precipitated algal blooms, which, in turn, initiated a chain of events that are responsible for the present condition of the resource. Because of continued overenrichment, algae production increased and the surface waters became filled with these small floating plants. The overabundance of algae prevented the penetration of sunlight into the waters, eventually causing the death of rooted aquatic plants essential to the stable ecological environment. Dead algae cells, cellular material from dead hyacinth plants, and the unconsolidating of the existing peat bottom resulted in the bottom characterized by loose, unconsolidated sediments—silt. This process quickly changed the desirable biological structure of the lake (loss of its sport fishery), and because of the accumulation of silt, the lake is gradually filling up. This process, if left unchecked, would result in a land mass where once there was water.

The plan for restoring Lake Apopka is simple—but not easy to accomplish: (1) Remove the artificial sources of nutrients entering the waters, and (2) Consolidate the loose bottom sediments to provide a firm substrate favorable for the propagation of desirable fisheries and plant life.

Implementation of this plan will involve, first, the removal of three major artificial, or man-caused, sources of nutrients. The Winter Garden sewage treatment plant is in the process of enlarging its facilities to include a series of polishing ponds and additional nutrient removal methods, if necessary. The Winter Garden Citrus Products Plant has already constructed an industrial waste treatment plant with nutrient removal facilities. An application for a grant for the treatment of muck farming wastes has been submitted to, and approved by, the Federal Water Pollution Control Administration—with an activation date set for July 1, 1970.

Secondly, the consolidation of the bottom sediments will be accomplished by lowering the lake to 58 feet above mean sea level, or approximately nine feet below the current level. This will expose approximately 75% of the bottom, of which 20-25% will have complete consolidation (drying) of sediments.

The process will be attained by both gravity drawdown and active pumping. Gravity drawdown will commence in the fall of 1970, which will bring the lake to 64 ft. above m.s.l. during the winter

(Continued on next page)

During the drawdown the downstream lakes will be maintained in their regular fluctuation schedule as controlled by the Southwest Florida Water Management District. Flooding will not occur downstream as the result of lowering Lake Apopka. The project has five time period-phases, from 1967 to 1973.

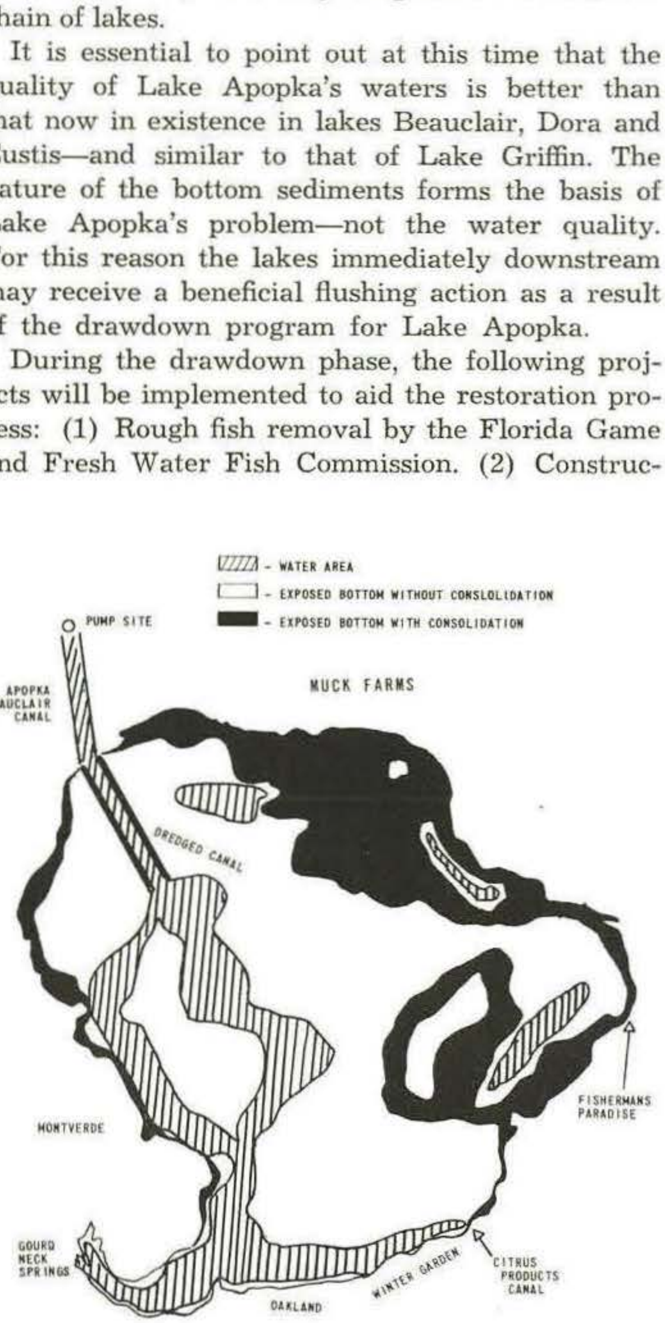
(*Continued from preceding page*)

of 1970-71. Pumping will begin around January 1972 and will continue through about April. The 58-foot level will be maintained for approximately two months (into the summer of 1972) and the refilling process will start with the 1972 rainy season. By late '72, the water level will have arisen to about 64 feet above m.s.l., which represents 90% of the lake's original water surface area. The completion of the refilling process to the 67-foot mark above m.s.l. will be attained during the fall of 1973.

The water will be sent, during drawdown, through the Apopka-Beauclair Canal. The intake area preceding the pumps will be so designed as to eliminate the passing of sediments downstream. The water will be continually monitored to evaluate its quality and to determine whether or not treatment and/or diversion is necessary to prevent unwarranted harm to the already seriously degraded downstream chain of lakes.

It is essential to point out at this time that the quality of Lake Apopka's waters is better than that now in existence in lakes Beauclair, Dora and Eustis—and similar to that of Lake Griffin. The nature of the bottom sediments forms the basis of Lake Apopka's problem—not the water quality. For this reason the lakes immediately downstream may receive a beneficial flushing action as a result of the drawdown program for Lake Apopka.

During the drawdown phase, the following projects will be implemented to aid the restoration process: (1) Rough fish removal by the Florida Game and Fresh Water Fish Commission. (2) Construction of artificial reefs by Orange County. These will be situated in areas not consolidated, to provide additional habitat for the propagation of sport fish and fish food organisms. (3) The planting of grasses to help consolidate the sediments after reflooding, (4) Bottom dredging for additional removal of sediments, and (5) Chemical treatment of exposed sediments to help maintain consolidation.



LAKE APOPKA DRAWDOWN - 58 Ft. M.S.L.

In the restoration period hyacinths will not be sprayed, except for navigation purposes through supervision of the Project Director. The Game and Fish Commission and Orange County are conducting research for the development of mechanical means to keep hyacinths in balance.

There are three studies to be carried out in connection with the restoration program. One by Florida Technological University will document the effects of the drawdown and refilling as a restoration method for use elsewhere. It will be financed by state and local funds—available through the Department of Air and Water Pollution Control, Florida Technological University, and counties involved.

The University of Florida's Environmental Engineering group will be carrying out studies concerned primarily with the nutrients released from the bottom muds and the recycling of nutrients in the lake waters. These studies will be sponsored by the Federal Water Pollution Control Administration and financed 100% with Administration funds.

Environmental Engineering, Incorporated, a private group composed of University of Florida engineers, will carry out a study on the treatment of muck farm waste. Their work will be financed by 70% federal and 30% local funds, with the muck farmers paying the local share.

The actual pumping phase of the Apopka drawdown will require the use of six 35,000-gallons-per-minute pumps. This operation will be planned by Wm. Bishop, Consulting Engineer, Tallahassee, under contract to the Florida Department of Air and Water Pollution Control. Pumping will be financed by state appropriation and local funds.

The total cost of the project is estimated to be $700,000.

Agencies participating in the project are, besides the Department of Air and Water Pollution Control and the Game and Fresh Water Fish Commission, the Orange County Pollution Control Department, the Lake County Pollution Control Department, the Southwest Florida Water Management District, Florida Technological University, the University of Florida, the Lake Apopka Muck Farmers, Incorporated, the East Central Florida Regional Planning Council, Environmental Engineering, Incorporated, the U.S. Army, Corps of Engineers, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, the U.S. Weather Bureau, the Central and Southern Florida Flood Control District, and the Florida Department of Natural Resources. ●

Springtime Bobwhites

To some the only believable signs of spring are budding plants and flocks of robins heading generally northward. But to the outdoorsman the surest, and sweetest, sign of all is the natural scattering of bobwhite quail from coveys he's hunted all winter. Biologists call it, simply, "covey breakup." It happens every spring.

Beginning usually in late February in south Florida, and about the middle of March in the northern counties, the coveys that have ranged and roosted together in a tight little social circle decide things are a little crowded. They begin to drift apart in preparation for pairing, for even in quail, three is a crowd when it comes to courting.

The covey breakup is a gradual development. Subtle hormonal changes within each bird affect its behavior. The close ties begin to relax and birds of both sexes may comprise small splinter groups which feed and dust together during the warming days. For some time, however, they all may reassemble into coveys to roost together in their neat rosette formations, with tails in and heads out.

But with the passage of time the covey becomes less and less important in the lives of individual birds. The little groups fail to seek the company of their kind at nightfall.

A certain sign that pairing is about to begin is the increasing impatience the cock birds have with each other. They begin to show rivalry, sparring at every turn, rushing at each other in harmless aggressiveness, and succeeding generally to get the message across that at such a delicate season three is indeed a crowd if two of its members are males!

Soon the hen makes her choice, and since there are more males than females in a typical winter covey the choice is literally hers. The honeymooning couple remove themselves from all other company and spend many days loafing around the range looking over the food and housing situation in anticipation of starting a family.

Quail are monogamous for the duration of the breeding season. Once paired they remain together for the summer. Each is dedicated solely to the production of young. Once the hen has laid her eggs, even her death would not alone prevent the brooding and hatching of the clutch. The solicitous male bird would take over the chore.

The egg-laying process takes from two to three weeks, depending on the productivity of each hen. The average clutch contains about 14 eggs, and, normally, the little hen lays one a day. Incubation, which requires another 15 to 20 days, does not begin until all of the eggs are laid. Between layings the pair casually passes the time away together, feeding, sunning, dusting, and, of course, keeping a watchful eye on their nest, which is well hidden under a tussock or deep in the grass.

Photo By Wallace Hughes

Favorable quail range has well-interspersed food and cover. It can be improved by encouraging native vegetation such as beggarweed and partridge pea, leaving fencerows, field corners and terraces brushy; planting food plots or strips to lespedeza and other foods; and discing land to help control plant life, aided by controlled burning in fall and winter.

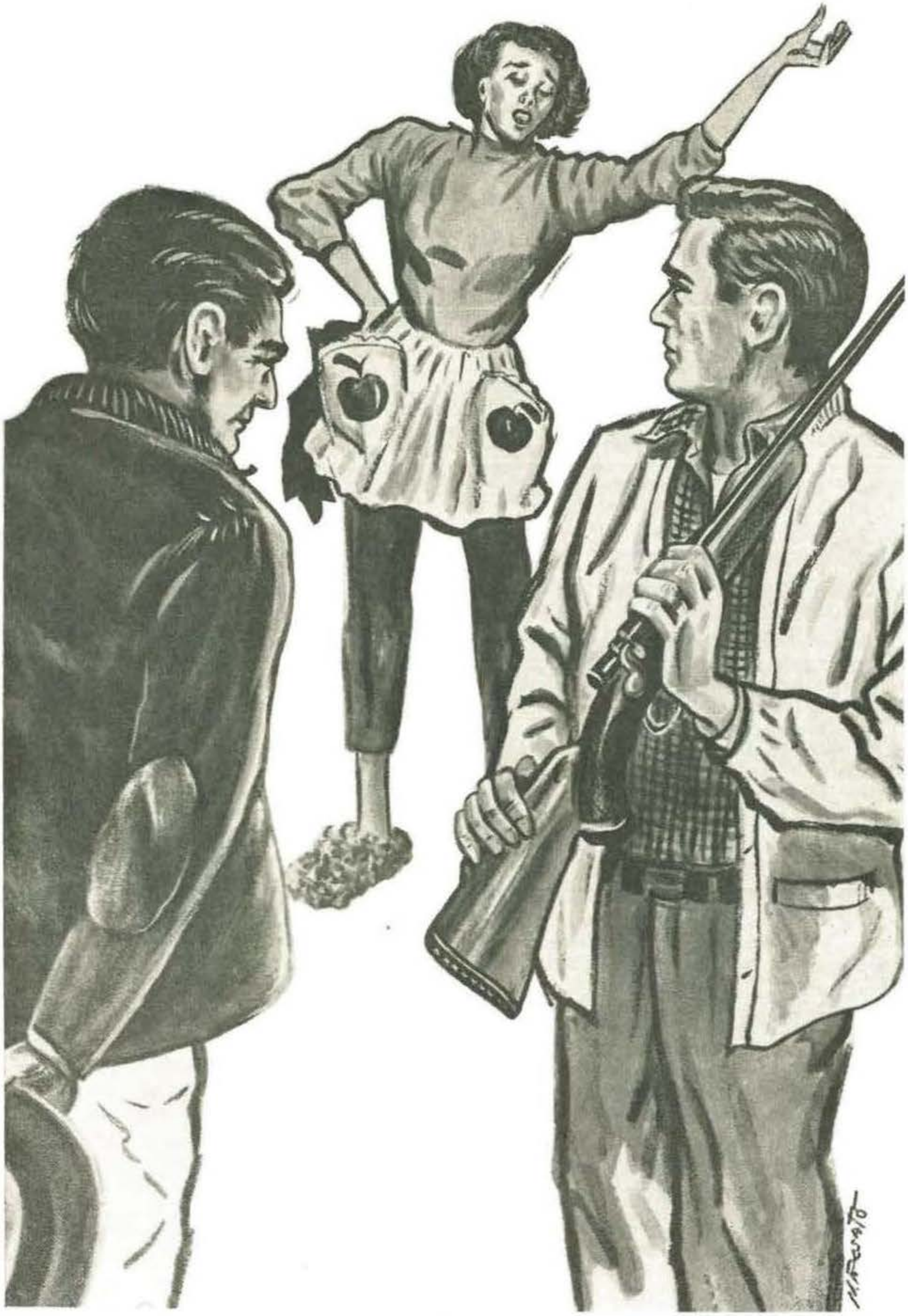
We noted there are more males than females at the time of covey breakup. What about those extra roosters? Do they find a mate? Hardly, since quail are monogamous—unless, of course, a widowed hen happens along at the right time, pairing time. The unmated males are the hard-to-spot birds we hear whistling their clear, far-carrying "ah-bob-white" notes on spring and summer days. This is a love song of sorts, but a lonely one. The bachelor birds are calling for female companionship. Some may still be heard into July and August, when the bulk of the year's crop of quail chicks is already feathered and flying.

And, speaking of the little ones, in average years —the weather being the major determining factor —these young birds will comprise roughly 80% of the quail on the range in the fall. Repeated studies show this percentage of adult birds are lost to natural causes—weather, disease, predatory animals—in a year's time whether hunted or not.

So, the mysterious and wonderful cycle continues—from covey breakup and pairing in the spring to family affairs in the summer to "fall shuffle," the term applied to the process of quail family disintegration as cool weather approaches. This results in the formation of new coveys, made up of members of many families. ●

Give Your Wife a Break

By ROBERT F. CUBBINS



A GOOD FRIEND of mine, an ardent fur-fin-and-feather man, phoned one night about a week before the opening of the deer season.

"Hi! It's Jim. Busy?"

"Not really," I said. "Just trying to get my gear together for our Saturday hunt." For the past half-hour I'd been checking ammo, touching up the edge on my knife, threading new bootlaces, and cleaning my rifle.

"Drop over for awhile. Got something I want to show you."

Satisfied that all was in readiness for the big day, I hopped into the car and drove to Jim's. His son ushered me into the living room, where Jim, perched on the edge of an antique velvet chair by a roaring fire, was working the bolt of a new 270. A bottle of Hoppe's No. 9 swayed dangerously on the exquisite Aubusson rug.

Jim stood up, tossed an oil-soaked rag on the mantel, and pressed the new beauty into my hands. Before I could utter a word, Jim's wife Meg appeared with a pile of newspapers, a large vinyl drop cloth, and a paint bucket.

With a cursory, "Hi, Bob," and a malevolent glance at her husband, she spread the newspapers on the rug before Jim's chair, covered the chair with the vinyl, put the Hoppe's and the oil rag into the paint bucket, and rudely prodded the setter lying before the fire toward the door. "Out, out, old Sport!" Closing the door on the hapless dog, she faced Jim. "*Must* you bring that mess into the living room? We *have* a basement; why don't you use it? You men and your hunting!"

With her last comment, mitigated somewhat by a constrained smile and a shake of her lovely head, she left the room . . . only to return in a moment with the vacuum. "Dog hairs! Dog hairs! Why did you build the doghouse? You might as well put the house *and* the dog in the living room—there's room next to the desk." Summarily, she departed.

"Well, what do you think of it?"

"What?" I said, gazing abstractedly toward the dining room.

"The rifle, buddy, the rifle. Beauty, isn't it!"

A Strong March Wind

I hadn't yet recovered my composure. Meg swept through like a strong March wind.

Sensing my embarrassment, Jim hastily dismissed the whole episode: "Oh, for gosh sakes! Don't let Meg's ranting bother you. Hear it all the time. These women have to have something to complain about. Pay no attention. Sit down. Coffee?"

"Yeah! Great. Thanks." Jim went for the coffee. I stretched out in front of the fire and looked around the room. Everywhere were touches of Meg's impeccable taste. The room was a showplace. . . . The room? I thought. Heck . . . the *whole* house . . . grounds 'n all. I thought of the beautifully manicured lawn, the outdoor barbecue area in the backyard, the spacious playroom for the kids, replete with ping-pong and pool tables, Meg's sewing room which looked like something out of HOUSE & GARDEN. It dawned on me that Jim, a man who devoted almost every leisure hour to his guns, his dog, and his fishing rods, had no den . . . no spot in the whole house he could call his own. Good grief, I thought. I'd go batty. So would my spouse.

Jim returned with the coffee.

"Say, old buddy," I proffered. "How's about my helping you build a little den where you could escape the pressure? Could do it in a weekend."

"Are you kidding?" was his immediate retort. "For what? Who needs one?"

"Well," I said, "for a starter, how 'bout Meg?"

Disregarding my comment, he hiked quickly up the stairs. I heard him rummaging about in the closet overhead. He reappeared about five minutes later with his old 30-06. "Remember this old thing? Hasn't the balance of the new 270." He grabbed the new rifle, thrust the old one into my hands, and leaned the oily beauty against the couch. The couch was also velvet . . . a soft gold.

For Pete's sake, I thought. He's worse than a six-week-old puppy. In the next 20 minutes, he visited the basement twice, the upstairs at least three times (maybe more; I lost count), and the broom closets in the kitchen. Five rifles and assorted shotguns now rested against various pieces of furniture (all of which were upholstered in delicate fabrics), and the rug was cluttered with boots, scopes, shells, books, and other accouterments too numerous to mention. These things he'd collected only after an exhaustive search through closets, drawers, and cabinets in every nook and cranny in the house.

An hour and two cups of coffee later, we'd run out of gas; it was time to break up the party. I couldn't leave, however, until I'd helped Jim return his gear to the honeycomb he had stretched from one end of his house to the other. I broke into a sweat before we put the last shotgun into its place on the shelf next to the furnace. Meg had long since retired when I reached the front door, having surrendered, I'm sure, to the primitive husband and his primitive friend.

Loves Dogs . . . Guns, Too

"I want you to come over in the morning, James . . . about nine o'clock. Bring your dog," I said. "My wife loves dogs . . . guns, too."

(*Continued on next page*)

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February 1970

(Continued from preceding page)

I left him standing in the doorway with a puzzled look on his face.

Jim arrived next morning about 10:45. True to form! He had never been punctual. Our bird hunts were always delayed until Jim arrived with his crackerjack of a dog. The dog was his saving grace.

"Okay, what's up?" he leveled at me.

I took him and the dog through the house to my den. "*This* is up," I said.

"What?"

"The den, buddy, the den," I said.

"You're not on *that* subject again. So you've got a den, and I haven't seen any changes in it for five years. So what?"

"So *this!*" I started with the corner desk, the spacesaver that allows me to cram all kinds of stuff into little space. Jim was a captive audience, and I fully intended to prove to him in a 10-minute guided tour of my 12 x 12 that a den is to the outdoorsman what a workshop is to a carpenter. All of my cherished items of equipment were readily accessible and all housed in one room with only two small closets.

"Okay, James," I said, "now tomorrow let's say we're going after venison." In two minutes I'd assembled on one of the twin beds my rifle, ammo, knives, boots, clothes, compass, and all the other goodies we nuts carry into the woods with us. Just as quickly, I returned them all to storage.

"Say, old buddy," I proffered. "how's about my helping you build a little den where you could escape the pressure."

I gave him no chance to offer a disparaging comment. "Now let's go bird hunting." In less time than it had taken me to give the first demonstration, I'd assembled bird hunting gear. The whole works.

"So you wanna go trouting, eh?" Opening a drawer within arm's reach, I secured a vise to the desk, plucked a few hackles and peacock eyes from one of its compartments, and went through the motions of starting a tie. A surreptitious glance at Jim told me he had perked up. He keeps his fly tying gear in a junkbox in the broom closet, and does his tying on an old card table that wobbles like a kid taking his first steps.

Everything Easy

In rapid succession I showed Jim that it was possible to perform all of the following without leaving my chair more than three or four times, and then only to step to a closet and back:

1. Clean rifles and shotguns
2. Oil boots and leather goods
3. Put my finger on any one of dozens of outdoor reference texts.
4. Repair rods and reels
5. Tie flies and leaders
6. Curry and comb my dog
7. Telephone the wildlife officer
8. Take a quick nap (He thought this was great.)
9. Show hunting and fishing slides
10. Escape from the family (Greater!)

At first he sat on the edge of the daybed with a sardonic grin on his face and a "So now I'm gonna get a lecture" droop to his shoulders. After I'd gone through the bird hunting routine, he said, "So you're organized . . . good for you. You'd make some guy a good wife. Haw, Haw, Haw!"

However, by the time he'd sat through the whole show, he was reaching for a pad and pencil on my desk. "How can I get a corner desk like that? What's that cabinet worth?"

I restrained the impulse to gloat and suggested that he might put a carpenter's square and a saw to use without damaging his shooting eye or reducing the arc of his casting arm. He rose, mumbled something about a corner of his celler, grabbed a piece of Danish from the breakfast table, leashed the dog and left with hardly a nod.

Three days later I phoned his office. "No, he's not in," his secretary informed me. "Said something about a lumber yard. Shall I have him call you?"

"No, thanks," I said. "I'll get in touch with him at his home." Ah, the sweet fruits of victory! I was sure to get one of Meg's stupendous apple pies for my efforts.

Drawings By N. Rosato

When Meg smiles, the furnace shuts down. She was smiling!

Two weeks after the den demonstration, the phone rang one night. It was almost 11 o'clock. I was warmly ensconced in my bed, reading a thriller about Kodiak bear.

"Wake you up? Sorry, old man. Want you to come over for a few minutes . . . *now*." He sounded insistent. Jim has a master sergeant's voice.

I feigned petulance. "It's 11 o'clock, James. Can't it wait?"

"Nope! Right now," he said.

Ten minutes later, Meg met me at the door. When Meg smiles, the furnace shuts down. She was smiling.

"What's up?" I asked.

"As if you didn't know." She pushed a cup of cocoa into my hand and led me toward the cellar.

It was beautiful. He'd walled off a corner of the cellar, installed enough shelves to house a city library, built cabinets all over the place, tiled the floor, hung pictures of hunting scenes on the weathered pine pallet lumber walls, built a desk into the corner and added a bed. One look at the curtains on the one window and the game bird prints on the bedspread, and I knew Meg had not been idle during the construction. Jim grinned like a kid let loose in a toy store for the first time.

All this took place two years ago. Since then, Jim's hung up two more trophy racks, an 8-pointer and a 7-pointer, enlarged the window, and installed a small hi-fi and TV set. Meg says his joints are creaking now from hibernating too long in his den. But the living room is a showplace again, the dog hairs are all on the den rug, Jim prepares for an outing between the main course and dessert, and, *best* of all, he hasn't been late for a hunting date since. And I *got* the pie . . . and a wild turkey dinner to go with it.

So what does one do with the long months between the seasons? Try sighting down the rib of a saw and testing your aim on a few nailheads. Build yourself a den you can enjoy all year long. It will be *yours* to keep as messy or as neat as you wish to keep it. And if you're smart, you'll allow no one to dust, vacuum, or polish. Do it yourself. Give your wife a break and she'll give you one. Well-intentioned but unfamiliar with the outdoorsman's tools, she might well consign your best hat, the smelly one with the stained brim and the holes in the top, to the wastebasket, along with a scope or two, some old feathers that "just collect moths and smell up your den," and mayhap, one day, all those old magazines that "just clutter up your desk." Let it be known that the best favor the wife can do for you is to see to it that the kids stay out of the den and cleaning be left to your expert care.

A Few Ideas

1. See your lumber dealer for desk, cabinet, and shelf plans. He can also tell you the best way to frame the area you choose. Only basic tools are needed: saw, square, hammer, etc.

2. Consider sturdy, unfinished pine or maple chests with drawers. These can be divided easily with plywood drawer dividers.

3. Old barn siding or weathered pine pallet wood makes attractive den paneling.

4. Inexpensive metal storage chests are available in many sizes. These can be painted to match the decor.

5. Consider a locked drawer for ammo.

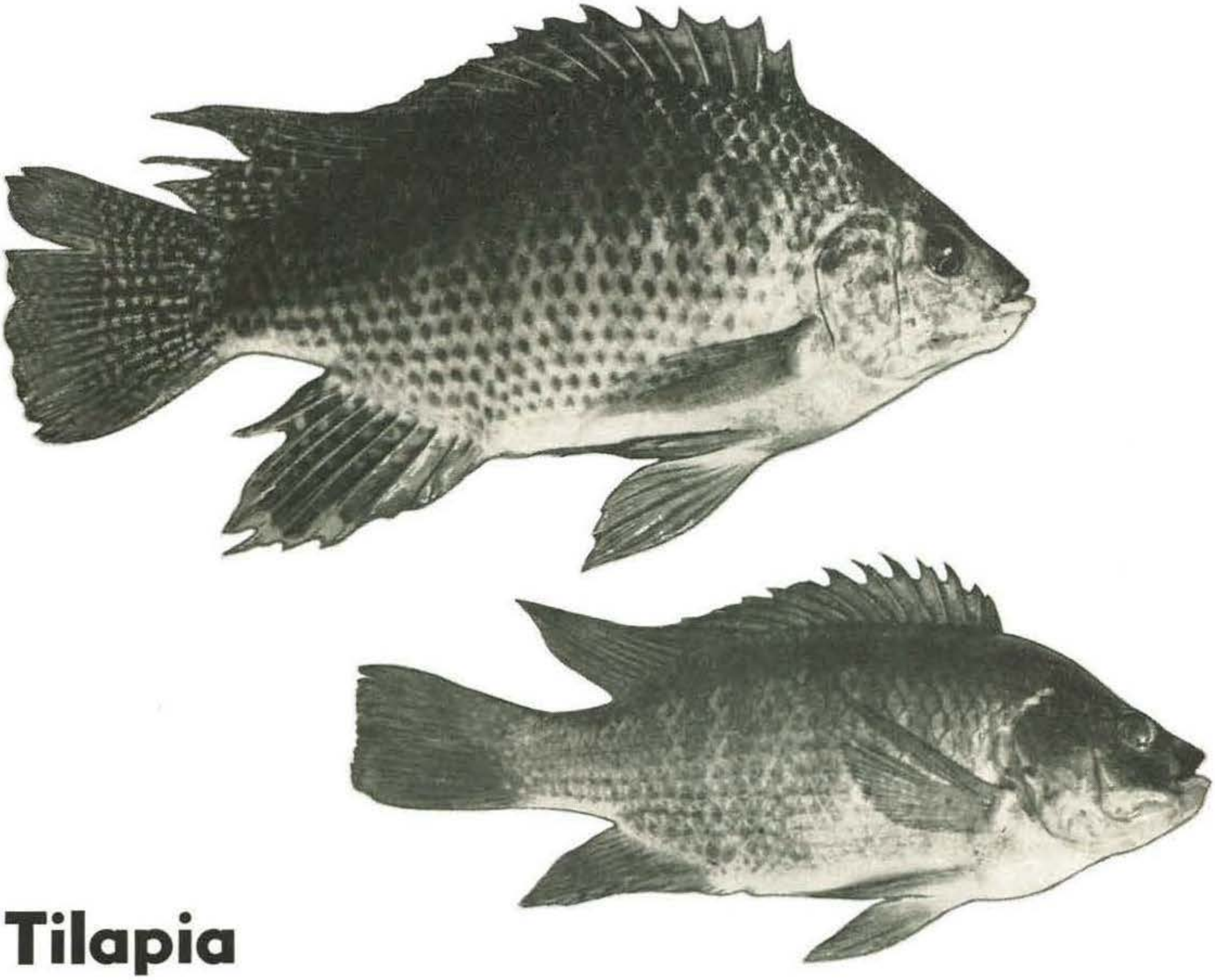
6. Shelves can be built with nothing more than red brick and 1 x 8s. Use heavier lumber for big stuff.

7. If you build your den in the basement, consider a suspended ceiling. It's easy to install and it can be removed in a jiffy to facilitate repair of pipes, heating ducts, etc.

8. An outdoor canvas hammock makes a good substitute for a small bed. Takes up less space, too.

9. Pegboard has a thousand uses. Look into it. The ⅛-inch stock usually suffices for everything. Get the kind with a hard finish. Usually darker than the untreated.

10. For more and better ideas, take a little siesta in your unfinished den. Keep your eyes open and mentally jot down what you think you might like to add in the next five years.



Tilapia in Review

If you stop to think about it—and we hope you will—there is very little real natural order left in the "natural world." People have seen to that.

By giving too much rein to our apparently insatiable desire to rearrange the plants and lesser animals of the earth we have made for ourselves and those who follow a potpourri of what was at one time natural order. It was seemingly inevitable that we would do so.

Because man, the animal in charge, proved so adaptable to the diverse climatic conditions of the globe, and because he became so very, very mobile, he almost casually went about reshuffling wild things—and still does.

We introduced European birds to North America, exported North American and European plants and animals to New Zealand and Australia, and brought Latin American, African, and Asian varieties to the United States. No inhabitable continent has been left out of this intriguing international tournament of biological checkers, and probably not one would claim it has won as much as it has lost to date.

Some of the results of our monkeying around with the world's flora and fauna are well known today.

We have house sparrows, starlings, carp, walking catfish, armadillos (from our own Southwest), marine toads, giant snails, water hyacinth, melaleuca trees, hydrilla (elodea), watermilfoil, alligator weed, and several species of tilapia, to name only a fraction of the exotics found in Florida.

New Zealand has hordes of rabbits, deer, and wild goats to contend with, among literally hundreds of other non-native plants and animals.

To be sure, all that glittered was not gold, but even so there have been a few examples of beneficial introductions of foreign game into the United States. Three upland game birds come quickly to mind: the ring-necked pheasant and chukar and Hungarian partridges—all originally from central Europe and/or Asia. The long string of failures, however, compared to the short list of successes should tell us something about playing with non-native wildlife—and it has.

We have learned to be more cautious; to study the life history of every prospective import; to attempt to evaluate each's probable effect, if any, on native species and habitat. The idea is to guard against future mistakes by carefully controlled studies of exotics considered for deliberate introduction, whether for a new game species or as a biological control over an existing problem. The potential danger of failing to thoroughly check out such candidates objectively is that one of them might replace a highly desirable native species while proving to be a poor substitute itself, if not an outright nuisance. It's a sad fact that the control angle doesn't always work out.

There are at least four ways non-native living things get spread around. Three of them have some manmade control mechanisms, none of which are foolproof.

First, some wildlife spreads itself, and there's not much we can do about it. Nature has to perform whatever control there is in such cases. Sometimes she turns her head. Cattle egrets have spread virtually around the world, mostly on their own. Rats are notorious travelers aboard ship, as are insects. Plants ride ocean currents.

Secondly, ordinary people traveling about like to bring home weird plants and small animals to show their friends—and just to see how they'll do in new locations. This accounts for a good bit of the reshuffling of small mammals, reptiles, and amphibians *within* the country but it also accounts for some of the international "shipments," too. There are federal and state laws against this sort of thing, but detection is rare and prosecution rarer. Fortunately, this group seems to have done the least harm of all.

Next, licensed commercial importers haul hundreds of thousands of specimens from other lands annually, mostly by air transport, for supplying the pet, exhibit, and laboratory trade.

Tropical fishes often escape from, or are inadvertently freed by, the shippers, wholesalers, retailers, or their customers. If conditions are right there may be breeding populations in public waters before they're even detected. Regulatory laws provide little or no insurance against poor judgment, accidental spills, or genuine escapes.

Finally, and ironically, a few potentially damaging exotics get loose when the control features of a modern scientific study break down. A case in point is the story of the blue tilapia (*Tilapia aurea*) in Florida—the exotic African fish we used to call "Nile bream" (*T. nilotica* before it was reidentified.)

The species sort of "busted out" of what was for a time a reasonably secure prison—an isolated study area consisting of several reclaimed phosphate mining pits in Hillsborough County. (See "Tilapia on Trial" by Art Hutt, FLORIDA WILDLIFE Magazine, December 1962.)

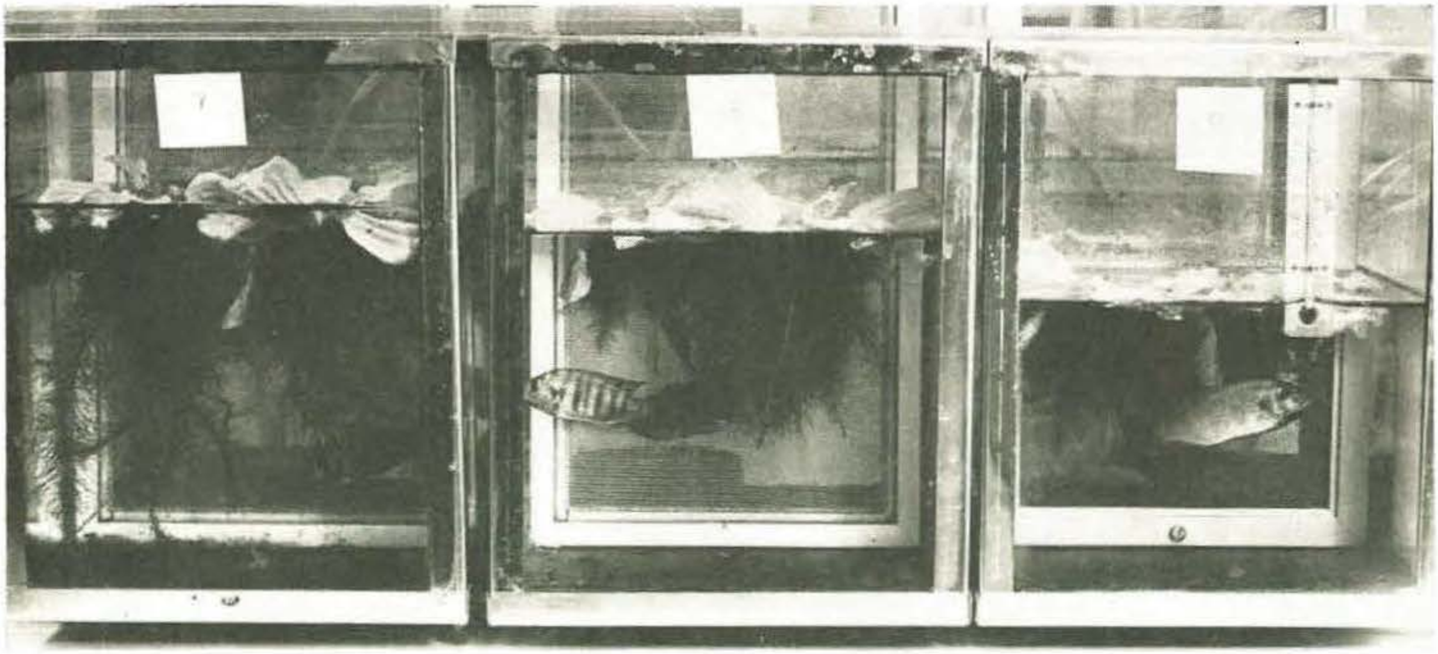
The story is well known to all but newcomers to Florida. What began in 1961 as a Game and Fresh Water Fish Commission research experiment

(*Continued on next page*)

By GENE SMITH

Photo By Wallace Hughes

Blue tilapia, left (top), is widespread in south Florida. It is a mouthbrooder—holds its eggs and young inside mouth for safety. It lays fewer eggs—500 to 800—than Congo tilapia (bottom), a nest fanner, which lays thousands of eggs per spawning and guards its young. Both are repeat spawners. In lab test, right, and in Puerto Rican ponds, the Congo tilapia's semi-digested body wastes have clouded up the waters rather rapidly.



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with *what might have been* an edible, non-competitive, plant-eating, catchable, bream-type imported fish is turning out to be a helpless vigil over an out-of-control, highly competitive, overpopulating, nonbiting, but still edible and algae-eating exotic which we may wish we had never seen!

In 1968, the blue tilapia was described by Commission Fishery Biologist Jon Buntz of Lakeland as "the fastest spreading non-native fish in the state"—and Florida has plenty of exotic fishes besides the two most widely publicized ones, blue tilapia and walking catfish (*Clarias batrachus*), the latter a much more recent introduction into the state than the former. (*Clarias* were first detected in Palm Beach County in March 1967.)

Referring to the Commission study of blue tilapia nine years ago, Buntz points out that overenthusiastic public acceptance of the fish *while it was still being tested* encouraged its rapid spread in south-central Florida.

"Several news media publicized the blue tilapia as a highly desirable species. With this encouragement fishermen caught them and stocked private ponds and gave them to friends. Some, who felt the Commission was proceeding too slowly with its studies, stocked them in public lakes.

"After the Commission completed the experiments it was decided the blue tilapia would be undesirable to Florida fisheries, largely because of its low catchability and extreme resistance to chemical control with fish toxicants. But it was too late. The fish was already breeding in public waters," he said.

Buntz's own investigations of the species have shown other reasons for its being undesirable. One is its tendency to crowd out native game fish.

In a study of the Lake Parker fish population in Polk County, reported in a scientific paper presented to the Southeastern Association of Game and Fish Commissioners, meeting at Baltimore, Maryland in 1968, Buntz found indications of competition between blue tilapia, shellcracker, and bluegill for the same spawning area. He also found, as had earlier investigators, that young-of-the-year blue tilapia in the 3-to-5-inch size group consumed insects in competition with native fishes. They fed on algae above that size—and ceased to bite baited hooks almost entirely as they grew larger, another serious drawback.

Buntz's conclusions on the Lake Parker tilapia study, and on the species in general, read, in part:

"Tilapia utilize eutrophic (overenriched) lakes that are becoming undesirable for sport fisheries and more suitable for rough fish. This does not ease the problem since their catchability is low. They appear to be competing for space and spawning areas with centrarchids (the sunfishes). This was made evident when 266 pounds of the species were collected in a 125-yard trammel net, comprising 84%, by number and weight, of the sample.

"If blue tilapia present problems similar to the introduced carp it is already too late to stop the problems with known methods of control. Tilapia will continue to spread throughout Florida and may invade other southeastern states. What effects they may ultimately have on native sport fisheries is, of course, unknown. Hopefully, the problems experienced with blue tilapia will stimulate more caution and better control of non-native species."

A new and different species of tilapia known as Congo tilapia (*T. melanopleura*), also from Africa, as the name implies, has now come under study as a possible ally in the war on aquatic plants in Florida, which impede water flow and wreak havoc with navigation in public waterways. It is most often mentioned in connection with being a biological

In lab tests of feeding habits, left, Congo tilapia showed they will eat most any aquatic plant but preferred native, beneficial types over noxious ones. In a temperature tolerance test, right, the fish were slowly "refrigerated" from balmy 84° F. down to 48° F. Three days at the 48-50° F. killed "all but a few."

Photos By Wallace Hughes

control over *another* exotic, the tropical water plant hydrilla, a nasty one, indeed.

As with the blue tilapia, the Congo tilapia had already been cultured experimentally at Auburn University, Auburn, Alabama before it was suggested for use as a weed control agent in Florida. Both species received qualified endorsement as to their respective performances in test ponds at Auburn, and by the Alabama Department of Conservation in state-owned and managed fishing lakes.

According to the Alabama Department of Conservation's Assistant Chief of Fisheries, Sam. L. Spencer, stocking tilapia is not one of the methods they normally recommend for the control of aquatic plants. He recalled two instances when fish hatchery ponds containing tilapia required chemical treatment for aquatic weed control, having become heavily infested with duckweed and algae. Tilapia did, however, receive credit for adding to the sport fishery and, in some cases, providing additional forage for crowded or slow-growing largemouth bass populations.

In November 1963, a shipment of Congo tilapia was brought into Polk County and stocked in a wildlife pool at a noted scenic attraction. The purpose was aquatic weed control. Sure enough, the Congo tilapia ate the algae in the pool—and practically everything else that grew there, observers report, even the lily pads!

This indicated a possible danger to the natural environment and urged extreme caution in the handling of the species until more research could be completed.

Fishery biologists Buntz and Charles S. Manooch of the Commission's regional office at Lakeland, summarizing their investigation of the Cichlid fishes in the South Florida Region, in a paper dated May 12, 1969, reported finding four members of that non-native family, three of which were tilapias. The fourth was unknown. They sent it to the British Museum of Natural History, London, for indentification.

Besides the blue and Congo tilapias they also reported the black-chinned mouthbrooder (*T. melanotheron*), which has lived in Tampa Bay for years. Buntz and Manooch collected them from the Alafia River watershed, a Tampa Bay tributary, in March 1969.

(Another cichlid, the African mouthbrooder, *Tilapia mossambica,* may be living in the waters of Palm Beach County. Positive identification of specimens collected there by biologist Vernon E. Ogilvie in November 1969 is still pending.)

All the tilapias overwinter quite well in the South Florida Region, although some die from the cold. Buntz and Manooch, in their paper, were of the opinion that "without doubt the survival of the hardy will establish a strain more resistant to cold temperatures."

With reference to the Congo tilapia's demonstrated ability to strip a body of water of all but the coarsest aquatic vegetation—they could destroy beneficial as well as harmful vegetation.

To date, Congo tilapia have not been found in any public waters in Florida. Hopefully, none have been released or transplanted from research ponds by unauthorized individuals. If not, it is a small miracle. And aside from that possibility, there is the old problem of tropical fish fanciers who might

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unknowingly purchase Congo tilapia for home aquaria. The public can help by being very certain *no exotics* gain their freedom in Florida waters.

About two years after Commission fishery biologists officially waved goodbye to *blue* tilapia, conceding that, like it or not, it was "here to stay," they were shaking hands with the *Congo* tilapia as a research subject.

The experiments got underway in September 1969 at the Fisheries Research Laboratory at Eustis, where Phase I of the investigation was completed. Phase II is being conducted in the field by Fishery Biologist Clayton Phillippy of Lakeland, with the assistance of regional fish management personnel and the lab staff.

The researchers plan to observe and document, while it's happening, just what Congo tilapia do to, or for, an isolated pond in south Florida—its vegetation, natural fish population, and water quality. That's what Phase II is all about. It is just getting started.

The laboratory work already done consisted of a food preference study in which various aquatic plants were introduced into tanks containing Congo tilapia, a salinity tolerance check, and a temperature tolerance test. Observations of behavior and effects on water quality and color were of value, too.

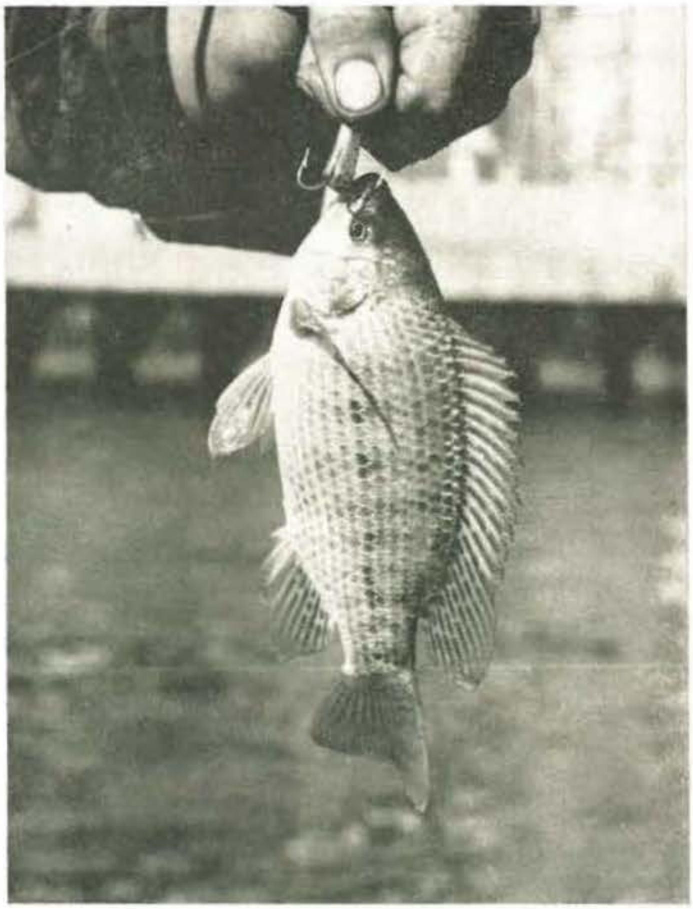
Also completed was a field trip to Puerto Rico last December by Phillippy to observe firsthand the effects of years of experience with cichlids in farm ponds and large impoundments there, and to discover the effects of Congo tilapia on sport fishing in those bodies of water containing the species. (They were introduced there for weed control by the U.S. Department of Agriculture's Soil Conservation Service in 1963.)

Added to the work completed is considerable information on the life histories of the tilapias gleaned from a literature search. Some very useful studies were reported in The East African Agricultural Journal and The Uganda Journal. They described the fishes' basic biology, including some very interesting information on reproduction and the results of shuffling the tilapia species around on their home continent.

From this body of knowledge the overall picture of what we're dealing with begins to take shape. But all the facts are not in yet.

Complete reports are on file with Chief of Fisheries John W. Woods, Tallahassee, but here, briefly, are some of the highlights of what we've learned to date:

Aquarium studies indicated the Congo tilapia preferred the aquatic plants tested *in the following order*: frogbit, naiad, chara, widgeongrass, common bladderwort, salvinia, hydrilla, water hyacinth, eelgrass, Eurasian watermilfoil, curlyleaf pondweed, water lettuce, and St. Johns wort. They ate them all with gusto!



Hydrilla, the plant it was hoped to eliminate, is ranked pretty far down the list. Also, many of those in the top spots by preference happen to be generally recognized as being of value to fish and/or wildlife, either producing and sheltering food organisms, or providing shade, shelter, or spawning area.

As the tilapia fed, the aquarium water became turbid and dirty at a rapid rate. This tendency to add to the fertility and turbidity is universally known where the species has been tried.

Temperatures of 50° F. began to kill Congo tilapia in the laboratory's controlled experiment. Biologist Dennis Holcomb, who ran this part of the study, took the test fish down one degree a day until they eventually ceased feeding (at near 50° F.) and began dying. He held the water temperatures at 50° to 48° F. for several days and lost "all but a few."

Buntz says winter dieoff was experienced in both Congo and blue tilapias in the winter just past, but that plenty of fish survived. "It doesn't stay *cold enough long enough* to kill them all." he says.

As for salinity, Congo tilapia were not particularly bothered by saltiness. Adult study specimens lived in 100% strength salt water; 21-day old fry survived and fed readily in up to 50% strength salt water.

Accordingly, Phillippy wrote in his Phase I Final Report, November 6, 1969, "Salt water will not be a barrier to the spread of *T. melanopleura* in Florida."

The species has proven so far that it will eat all types of vegetation, beneficial as well as noxious; that it is extremely tough; that it thrives in dirty, overenriched water; and that it will feed with great enthusiasm on subadult sunfish fry, which the researchers added to the test tanks. The bream disappeared rapidly.

"It appeared to me that the fish will eat anything," says Dennis Holcomb, "including each other —if nothing else was left for them. I think they'd eat Cheerios if that's all they had. Congo tilapia are not strictly herbivorous."

Phillippy summarized in his report, "Florida's native Centrarchids would not fare too well against *T. melanopleura* during competition for spawning areas."

But the most serious indictments against the Congo tilapia involve its definite tendency to overpopulate and crowd out other species, thereby causing its own kind to stunt, which has been a matter of record wherever the fish occurs naturally and wherever it has been taken.

Phillippy saw evidence of this in Puerto Rico, and U.S. Government studies there bear it out.

The final real threat from introducing this fish into our public waters is its known tendency to replace game fish, particularly sunfishes, in the sport fisherman's creel. One thing can be said for Congo tilapia: they are highly catchable! Unlike their timid relatives, blue tilapia, they eagerly take baited hooks. But how many shellcracker, bluegill, and speckled perch fishermen do you know who'd trade their fish for an equal poundage of Congo tilapia?

As for the blue tilapia, now quite plentiful in the South Florida Region, the only use we are likely to get out of this species is to develop a commercial fishery for it in fresh waters. Sport fishermen are limited to a fractional harvest of the Lake Parker population—and this by use of snatch hooks and cast nets under special permit from the Commission. (Very few bite baited hooks.) This fishery is seasonal, working best in the winter months when the tilapia congregate at their warm water oasis, the City of Lakeland's electric power plant outfall right next to U.S. Highway 92.

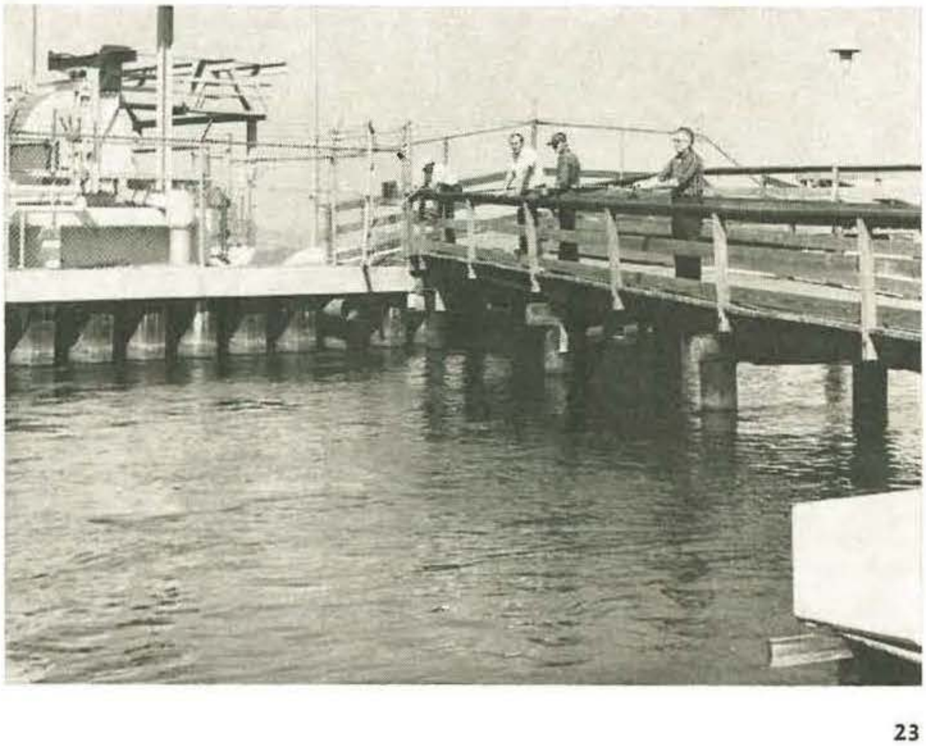
In the belief that commercial exploitation of blue tilapia is a possibility, Buntz and others are trying to figure a way to trap them efficiently in Lake Parker. The tilapia from Tampa Bay, *T. melanotheron,* contributed about 40,000 pounds at 50¢ per pound to salt water commercial fishermen last year. Perhaps the fresh water fishery, if developed, can do at least as well.

To wrap up this look into exotics in general and Florida's tilapia situation in particular, the Commission feels that it cannot overlook any possibility in the long war against harmful aquatic weeds. For this reason it will continue to work with tilapia or other exotics that might possibly provide biological weed control while at the same time taking every possible precaution against the release of such exotics into the Florida environment.

While working with exotics we concur generally with Dr. Durward L. Allen's view on the subject, as expressed in his book OUR WILDLIFE LEGACY, published in 1954:

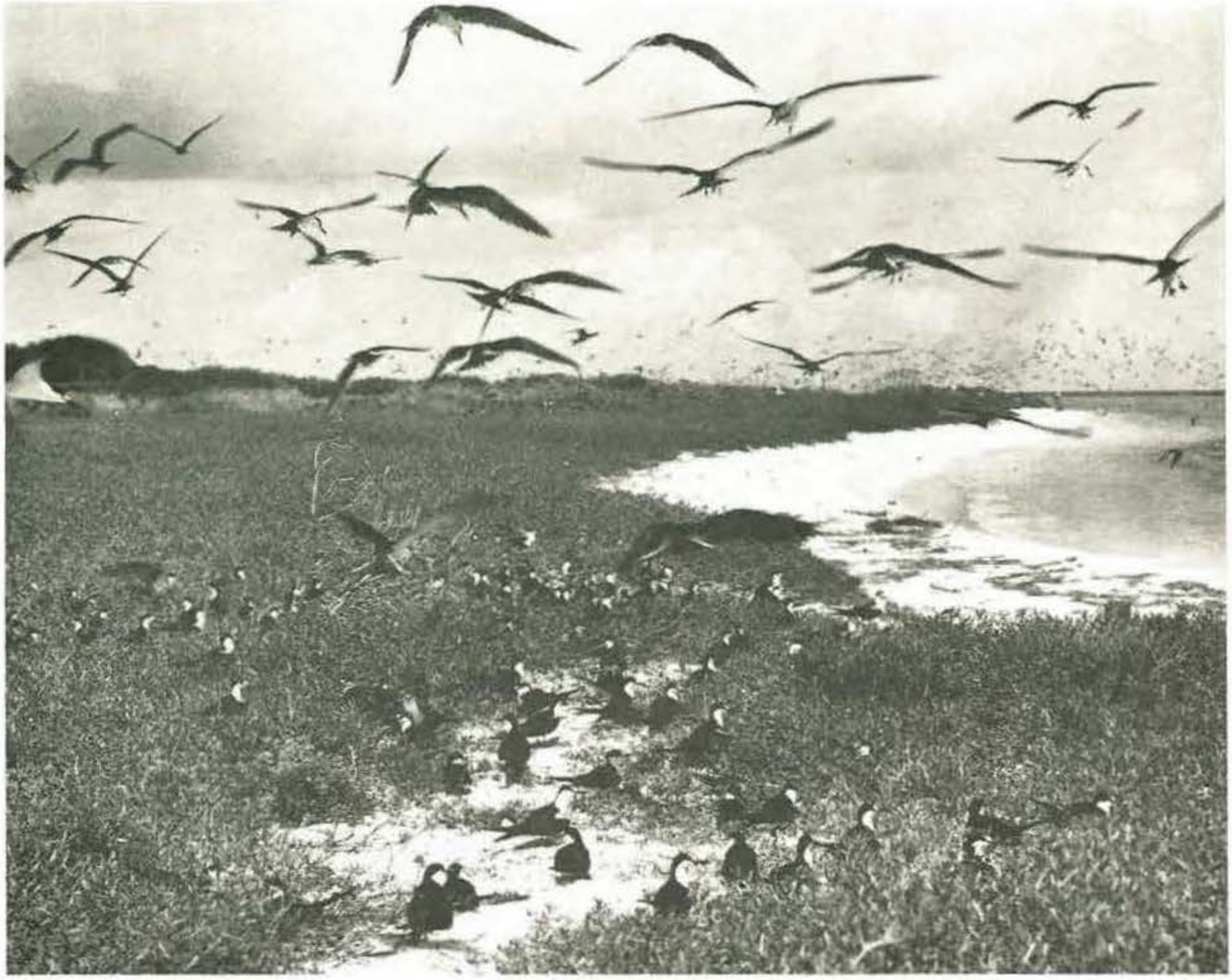
"Experience has amply demonstrated that even the most desirable appearing foreign species can become an arrant liability, and this should rule out any continuation of hit-or-miss importations. Caution and thorough study of all possibilities are clearly indicated before we do any more adventuring with exotics . . ." ●

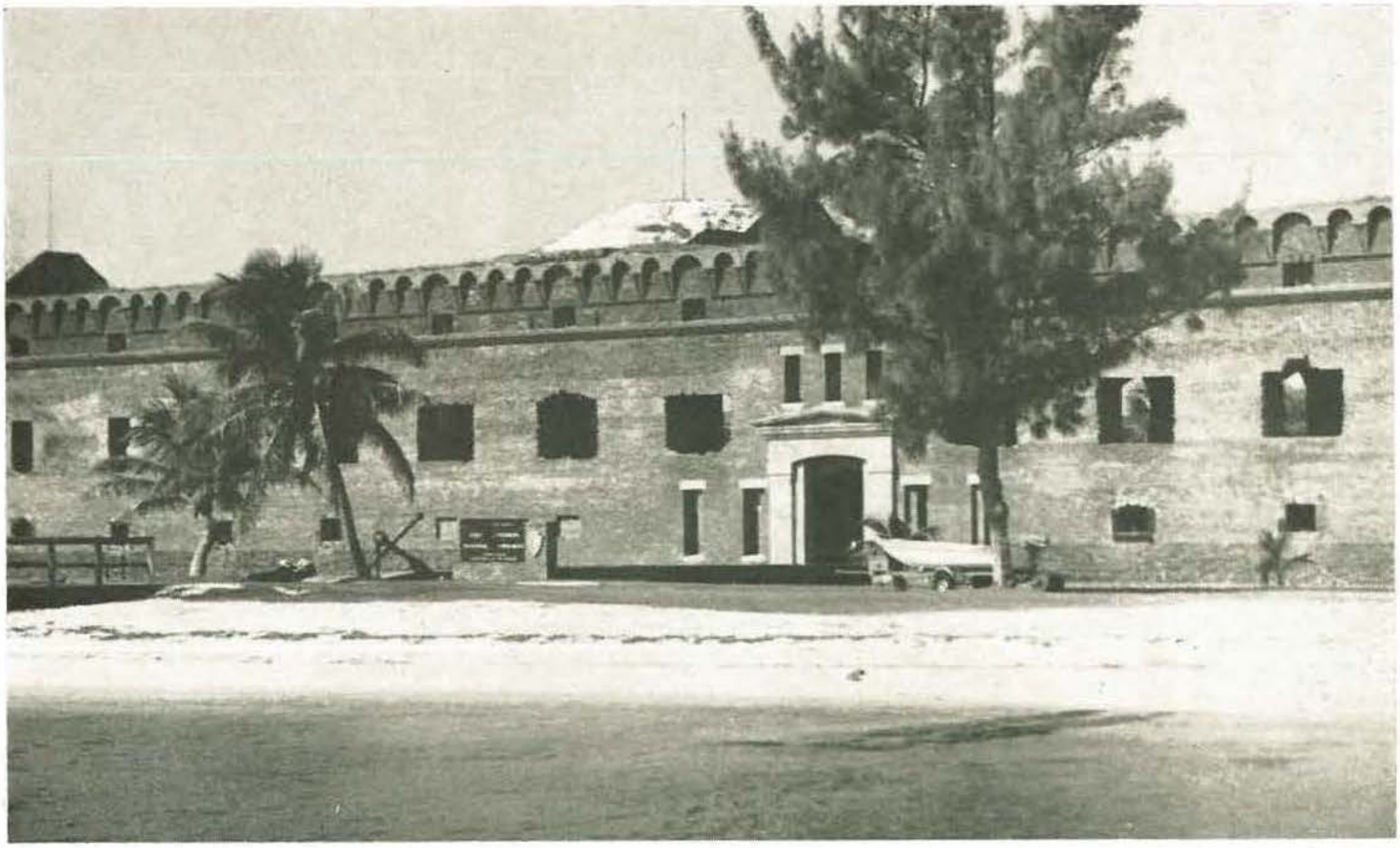
Photos By Robert Wood



Lake Parker Fish Management Area at Lakeland supports what is probably the largest population of blue tilapia in the U. S. The harvest is limited to snatch hooking, left, and cast netting. Hook and line catches are few. Congregated tilapia are available in winter at the city electric plant spillway, right. All tilapias tend to overcrowd and compete with the sunfish for food and space.

Stained by more than a century of wind, rain and baking sunlight, the brick walls of Fort Jefferson, above left, remain strong and solid. Aloes, above right, are among the few plants that survive at the fort. In the background is the "Tortuga Taxi" that was used last year to land an 862-pound fish. Nesting colony of Sooty Terns, below, on Bush Key, about 200 feet from Fort Jefferson drawbridge.





Photos By Mary Ellen Smith

A lone Australian pine and a few coconut palms struggle with salty winds on a narrow stretch of beach near Fort Jefferson entrance. Apertures were designed for guns—not as windows.

the Outermost Fort

a weathered and baked historical site being kept in original form

By MARY ELLEN SMITH

EARLY ON A BRIGHT January morning, with a cold north wind snapping the flags at the Navy Base in Key West, the S. S. Tortuga nosed out of the island harbor and sped on a rough water course toward a remote island in the Dry Tortugas.

The 50-foot ship, designed as an oil rig crew ship but now operated by the National Park Service, cut through a boiling, churning sea, whacking smoothly into waves that sent spray flying over the cabin windows. It was bound for Garden Key, a speck of land 70 miles distant, on the edge of the mighty Gulf Stream as it flows from the Gulf of Mexico toward the Atlantic. The ship carried supplies for the staff at Fort Jefferson, one of America's most isolated national monuments.

For Captain Cliff Green, the trip was routine. For me, as a guest-passenger, it was an unforgetable experience. For three hours the ship ripped through a choppy sea under a blue-white sky. Once we glimpsed a frigatebird, soaring like a kite on its seven-foot wings. We passed the Marchesas, ghost islands on the northern horizon. Then, finally, we glimpsed the old fort.

Slowly, clearly, Fort Jefferson rose out of the turquoise sea. Noon sunlight shimmered on the long, rose-red brick walls, igniting fires of light here and there, darkening the black slits of windows and showing us, in stark outline, the black cannon on the terreplein, or roof.

Weathered by a century and a half of storms and baking sunshine, ravaged by pirates and souvenir hunters, the red brick fort appeared to rise directly from the sea. But soon we could see a drawbridge over a moat and in front of the drawbridge a dock and boathouse. The barking of a dog and the voices of Boy Scouts carried over the water, mixed with the cries of herring gulls and royal terns.

The ship docked against the pier and hands lifted us over the sides. James E. Markette, district manager of Fort Jefferson National Monument, and his wife, Maxine, led us across the drawbridge and

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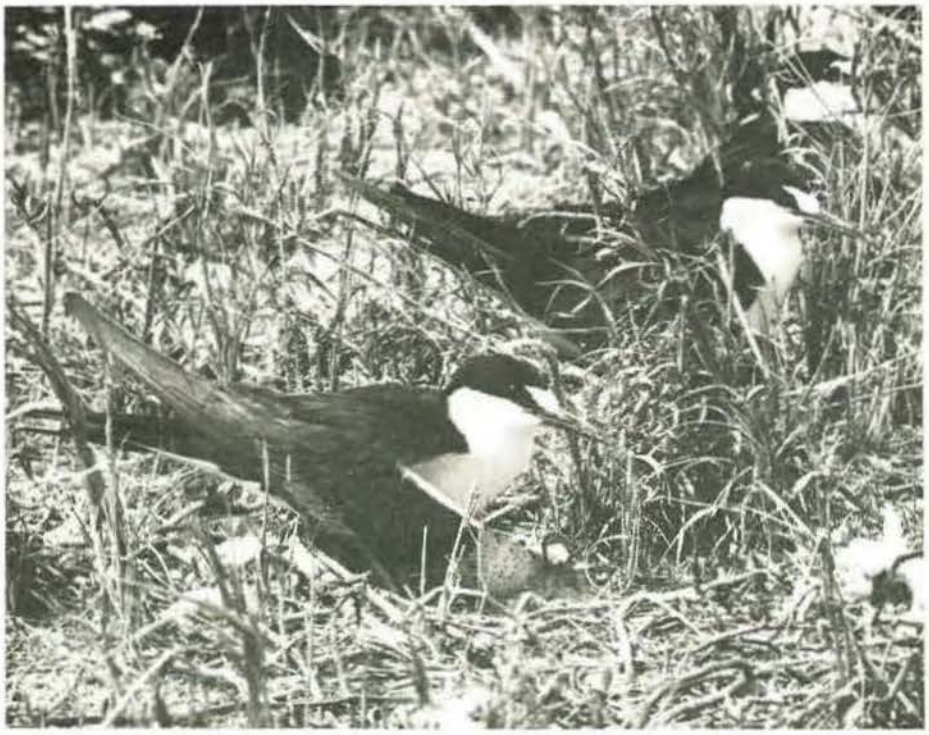

Florida State News Bureau Photo

Photo By Lovett Williams

The Sooty Tern, above, is a nesting bird in Florida only on Bush Key in the Dry Tortugas. Approximately 150,000 reside there from April to September. The Frigate-bird, right, can often be seen soaring gracefully over the fort.

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into the old fort and back to the days when America was young, and men like Thomas Jefferson thought it could be defended by forts with 8-foot thick walls and tiers of cannon.

The Fort Jefferson National Monument includes 47,000 acres of land and salt water. There are seven tiny islands, but only Garden Key, where Fort Jefferson stands, and Loggerhead Key, where there is a lighthouse, are inhabited by people. The other islands are for the birds. Bush Key, about 200 feet from the drawbridge, is nesting ground for some 200,000 terns—mostly sooty—from April to September. In January, we saw but a few.

The Tortugas were named by Ponce de Leon in 1519 because he saw there many sea turtles. The "Dry" was added later by thirsty sailors. John James Audubon came to Bush Key in 1832 to see the great clouds of sooty and noddy terns. In those days the eggs were gathered by "eggers" who sold them in Key West as hen's eggs. According to old records, these men would smash all of the eggs on the island, then the next day would gather all the freshly laid eggs. Today visitors are not allowed to disturb the terns and, in summer, seaplanes are not permitted to land within 100 yards of the key.

The Markettes, we found, live in a two-story brick house used during the Civil War by the fort's commanding officer. (Union troops held the fort.) The interior of the house is modern; it has electric light and running water (purified rain water). Without benefit of TV or daily newspapers, they live well.

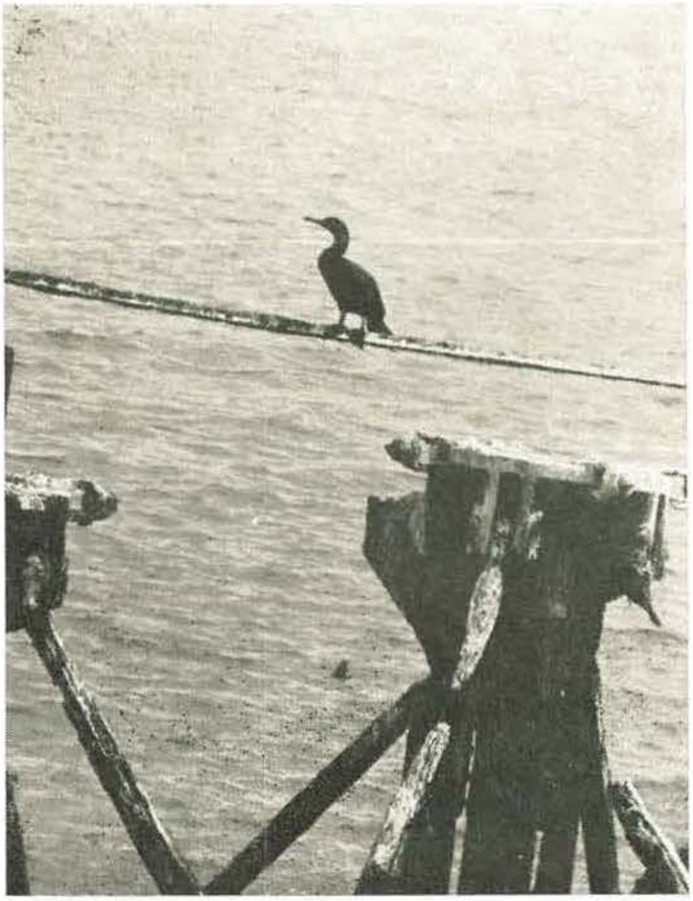
Jim Markette, the burly, 200-pound director of the monument, probably is the only park ranger who ever lost a tennis shoe to a hungry shark or caught a 862-pound jewfish with a Ford tractor.

But Markette, an expert diver, knows the undersea trails almost as well as he knows the brick paths that border the inner yard of the six-sided fort.

The tractor fish story which Markette related over a dinner of broiled crawfish is one-of-a-kind.

"This jewfish weighed 862 pounds, not 850 as a Key West newspaper reported," he said in a voice as southern as a Confederate flag. "I hooked it with an 8-pound bait. But it shook the pilings on the dock. I yelled to Dave Baker to go to the beach and if I could get enough slack line, we would tie the fish to the tractor. We did this, and I got on the tractor and started up the beach.

"Then that fish started pulling the tractor back into the sea. Dave yelled, 'How we going to explain that a fish got our tractor?' But I kept working with the tractor and finally the wheels got traction and we pulled the fish out. We put him on the davit, 862 pounds. I froze the meat and sent it to Homestead."



Photos By Mary Ellen Smith

Thirty-one thousand visitors stayed overnight at the monument in 1969. Most of them slept in boats or on the beach in tents. They used the outdoor lights, picnic tables and barbecue pits. They came by boats or aircraft, and brought their own stocks of food, water, oil, and gas. VIP guests included Ralph Evinrude, Frances Langford, Mr. and Mrs. Steve Briggs, John Pennekamp, Randolph Hodges and others.

"Most of our visitors are sportsmen, historians, or scouts," Markette said. What do they say about the fort? "What a pile of bricks!"

Surely if the western world has its manmade wonders, Fort Jefferson must lead the list. The three-tiered, casemated fort sprawls over 13 of the island's 16 acres. It encloses a courtyard where the ranger's home and the ruins of former barracks are located. Planned by the U. S. Army Engineers, the building of the fort began in 1846, with slave labor, and continued for 30 years. But it was never quite finished. It was designed for 450 guns and a garrison of 1,500 men. Bricks were brought from Mobile and Pensacola, and granite and slate from New England.

During the War Between the States, the new fort was used as a prison. Harper's Magazine noted:

"The summer of 1863 was hot and the war was

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The light at the fort was moved, long ago, to Loggerhead Key, seven miles to the west. But the old tower, left, stands black against the sky above the 50-foot high walls. A lone cormorant, above, perches on rusting steel cable, part of an old ruin at the now National Monument. Cannon, right, still rest on the roof, or terreplein, of the old middle 1800's fort.

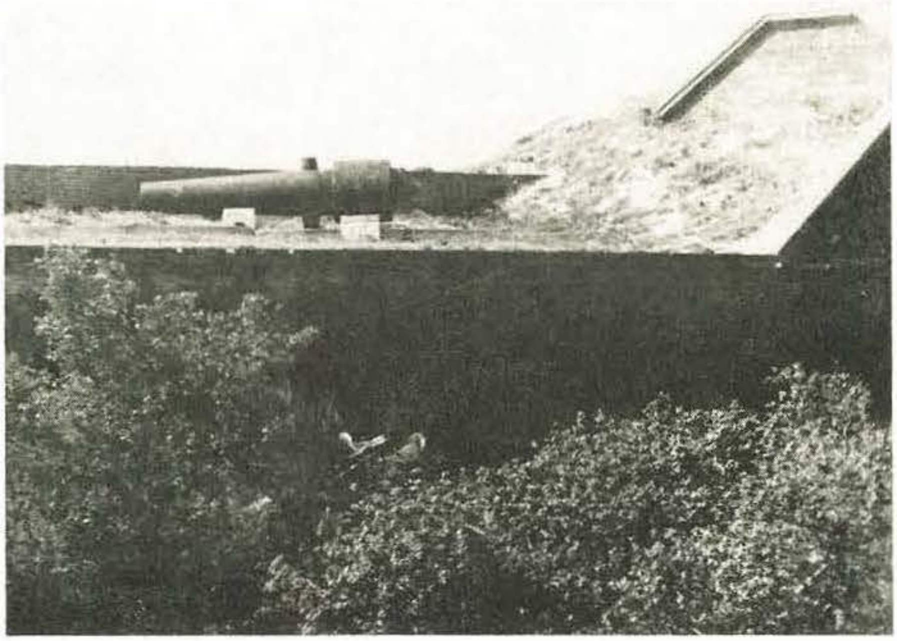

Photo By Lovett Williams

The Brown Pelican is another frequent visitor to Fort Jefferson.

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at its height. Prisoners thronged the fort, and still they came. Nearly all were tainted with scurvy. There was no money for the lime juice needed to control the disease.

"Dr. J. B. Holder, stationed here during the war, organized a theatre to raise money for buying limes, and fresh vegetables. As the "Tortugas Amateur Dramatic Club" this Fort Jefferson institution flourished for a decade. Dr. Holder also scoured the Keys for edible plants. He put purslane (*Portulaca oleracea L.*), a tasty native green, on the mess hall menu.

"So the doctor got his limes and vegetables. Three times a day the 500 men on the sick list drank lime juice, and there was, wrote the good doctor, 'a rapid and steady improvement.' "

Markette and his assistant, Anthony Walton, conduct tours for visitors. They point out the ground floor cell once occupied by Dr. Samuel A. Mudd, who set the fractured leg of Abraham Lincoln's assassin. Later deemed innocent of conspiring against Lincoln, Dr. Mudd was imprisoned at Fort Jefferson from 1865 until 1869.

Mudd spent much of that time in irons, or cleaning brick. He wrote his wife and four young children in Maryland that his food was only "coffee, bread and butter." A real conspirator, imprisoned with him, wrote: "The bread is a mixture of flour, bugs, sticks and dirt. The meat is so rotten dogs run from it." When the post surgeon died during a yellow fever epidemic, Dr. Mudd was released to care for the sick, and in March 1869, he was pardoned.

The Tortugas fort, which never fired a shot in anger, in 1935 became a national monument.

"Most of our wildlife here is bird life and fish life," Markette says. "In summer, we have the terns—royal, sooty, noddy, roseate, and least terns. We have frigatebirds, pelicans, gulls and cormorants the year round. As for fish, in these waters there are snapper, grouper, kingfish, cero mackerel, yellowtails, jewfish, all kinds of sharks, crawfish, conchs, and pilchers for bait. There are hawksbill, green and loggerhead turtles."

An underwater self-guided trail leads snorkelers past coral beds, and visitors with SCUBA can discover a brilliant undersea world.

The grounds enclosed by the fort are neatly kept but vegetation is struggling and meager. Trees include a buttonwood (a mourning dove has built a nest there), date palms, geigertrees, gumbo limbo and a plum from New Caledonia. A few guavas, Key limes, bananas, cacti and aloes survive. The grass, Markette said, is "mostly sandspurs."

The view from the second floor, or the top of the old fort is never to be forgotten. Through ragged openings in the brick arches, you see the sea sweep from horizon to horizon, from here to infinity, striped with turquoise, cobalt, violet, aquamarine, and even gold. We also saw the moon rise out of a death-black sea, to outline the spars of a sailing ship, and to silver the water where three shrimp boats rode at anchor.

Fort Jefferson is not for the timid boatman or the finicky tourist. But for anyone who can sleep under the stars to the lullaby of the sea, and cook outdoors, it is an experience never to be forgotten.

"Anybody is welcome out here who doesn't want to raise a ruckus or carry off part of the fort," says Markette, who keeps a fish hawk's eye on all the bricks and cannon. "We aim to keep this fort in its original state." ●

Photo By Mary Ellen Smith

Broken coral and crushed sea shells literally form the beaches around the old fort's wall.

Gun Parts

with urgently needed gun parts often hard to find locally, it is a good practice to keep supplies of certain replacements for immediate use

By EDMUND McLAURIN

Over many years of personal contact with all types of active shooters, it has been my observation that few owners of scope sight- or adjustable peep sight-equipped .22 caliber rifles get maximum benefit from their sights.

The modern .22 caliber long rifle cartridge is one of the most accurate in the world. The manufacturers of sporting ammunition have devoted years of specialized technical research to achieve its dependable performance at relatively low retail cost per shot. It is not surprising that billions—that's right—*billions!*—of .22 caliber cartridges are purchased and fired annually.

Each round of factory-fresh ammunition will invariably do its job if you do your part.

Many misses with the potent 40 grain long rifle lead bullet could be effective hits if full advantage were taken of bullet trajectory.

Precise setting of rifle's metallic sight combination, or critical adjustment of a good scope sight, will tend to bring out the full inherent accuracy of any .22 caliber rifle.

To place high in today's formal club matches and tournaments, the competitive smallbore rifleman must carefully sight in for exact distances and bullseye sizes standard to National Rifle Association or U.S. Army qualification or competitive course firing, and thereafter make needed sight adjustments only after consideration of changing wind or range factors.

Not so the average user of a .22—the small game hunter, or the plinker who likes to shoot at a variety of inanimate, and often breakable, targets. He can sight in to take maximum advantage of .22 caliber bullet trajectory—for close shots or distant targets—then forget about frequent sight changes unless he has reason to believe a hard bump or other field mishap has knocked the sight "out."

To help you sight in, here are some practical, field-use *trajectories* for an accurate .22 using either high speed or standard velocity .22 long rifle cartridges.

With a scope sight and .22 long rifle high speed ammo, I like to sight in at 20 yards from rifle muzzle, until bullets hit exact point of aim at that distance. I know I'm truly zeroed in if I can drive the tacks holding the target corners right through the board one by one.

With a "dead on" zero at 20 yards, I find that bullets hit only slightly high at 25 yards, one inch high at 50 yards, "dead on" again at 75 yards, and three inches low at 100 yards *with unchanged sight setting and sight picture.*

For me this proves to be a very practical field use sight setting for combination of scope sight and high velocity ammunition. Mid-range hits seem positive and easy to make.

On the other hand, I have a friend who sights-in with scope and high speed ammunition at only 15 yards from rifle muzzle, to hit point of aim at that distance. His bullets rise until they print 1$\frac{3}{10}$ inches high at 52½ yards from rifle muzzle, "dead on" again at 90 yards, and only 1½ inches low at 100 yards. He hits his share of targets, too.

For a .22 caliber rifle equipped with low-line metallic sights, like the Redfield Model 70 rear peep and blade front sight combinations I use on my Winchester Model 61 and Marlin 39-A, I like to sight-in with standard velocity .22 long rifle ammunition to hit point of aim at 50 yards from muzzle. Most shooting with these rifles is informal short-range "plinking" at small size tin cans, bottles, empty thread spools, bottle caps, empty shotgun shell cases and other types of readily available miniature targets that hold appeal and challenge. Any target between muzzle and 50 yards is in danger with this particular trajectory curve, metallic sights and .22 long rifle, standard velocity ammunition.

Whichever sighting-in distance you select as most practical for your own .22 shooting, stick with it until you know *exactly* what bullet performance will be at various ranges.

Familiarity with bullet rise and fall all along its trajectory curve between muzzle and target is a shortcut to sure hitting, whatever the nature of the target.

Being an inveterate outdoorsman and camper, I have had numerous opportunities to use different styles and brands of portable charcoal grills.

Some have been good, and some have been impressively poor.

The efficiency and pleasure of use has been largely influenced by functional design, portability

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and easy set-up and take-down, rather than cooking efficiency alone.

One unit that I particularly like is the Palco all-aluminum Model 650 "Port-O-Grill," made by Palco Products Division of Worcester Pressed Aluminum Corporation.

Size—17¾″ × 8½″ × 6¼″—and weight—a fraction under five pounds on my scales—seem perfect.

Made like a fishing tackle box, with heavy, rounded aluminum carrying handle, snap lock and off-the-ground bottom, the little grill is ready to use within seconds after its hinged cover is raised and the folding wind baffles positioned and locked in place.

The removable cooking surface grid is chrome-plated—not plated with a dangerous cadmium coating as is sometimes found in off-brand, commercially made grills, and homemade cooking grills incorporating a discarded refrigerator shelf.

To cause the charcoal cooking fire to quickly die out when cooking is completed, the lid of the "Port-O-Grill" is merely dropped into lock position. The fire is soon extinguished and the grill, being aluminum, cools just about as quickly as it gets hot.

The "Port-O-Grill" is easily carried in trunk compartment of car, behind front seat, or under a boat seat. I find that it can be put anywhere you might pack or store a tackle box of comparable size.

The fuel section makes an excellent storage compartment for the quantity of charcoal usually needed for a single cook-out, I have learned from repeated use.

Most stores that stock the Palco line of aluminum canteens and cooking kits likely have the No. 650 "Port-O-Grill".

And when you run across some outdoor item that is an outstanding performer for you, please drop me a line! Like you, I don't want to miss out on anything worthwhile.

IN THE 1870's Fred Kimble conceived the very practical idea of putting choke in a shotgun barrel to control the shot charge so that it would not open too quickly after leaving the muzzle. Effective killing pattern range was thereby extended.

More than half a century later Colonel Richard M. Cutts invented the combination recoil reducing and choke controlling Lyman-Cutts Compensator. E. Field White followed with the Poly Choke, a muzzle-attaching, collet-style choke controlling device giving the shooter finger-twist choice of any of nine degrees of choke.

Their installation on single barrel pump-action and autoloading shotguns helped to make these types of shotgun actions tremendously popular.

Shooters like the easy access and fast change to any desired degree of barrel choke, without having to change barrels. They find it in both the still available (and improved) Lyman-Cutts and the Poly Choke, as well as in later developed products like the Emsco, Cyclone, Vari-Choke, C-Lect Choke and other current brand names that use either the Lyman-Cutts' or the Poly Choke's basic functional principle.

But for more than a hundred years the conventional shotgun barrel used by sportsmen has been made only in round muzzle shape, whatever the type of action used with it, or added muzzle attachment.

Then in 1968 some ingenious employee of Kexplore, Inc., Houston, Texas, kinetic research engineers, hit on the idea of slightly flattening the shotgun muzzle so that it has a more horizontal spread and looks as if it were accidentally caught in a hard-slammed car door. (Perhaps that is where the inventor got the idea!)

There is now on the market a shotgun muzzle attachment that fastens on a conventionally round shotgun barrel and reduces vertical spread of the released shot column while increasing horizontal spread.

Just what value the new product will have for the field and target shotgunner remains to be seen.

Theoretically, the potential benefit is there—because it is recognized fact that most missed shots are due to shooting behind fast-moving targets. Spreading the shot charge out longer horizontally may solve the missing problem of many slow-swing gunners. Horizontal spread of No. 4 buck shot will cover a rectangle 8 feet long and 2 feet high at 40 yards from shotgun.

A photograph of the A&W Shot Charge Diverter is not available to include with this article, but the new device should be kept in mind, for it may well prove beneficial to sportsmen.

I do have a supporting photograph of something equally revolutionary—a new model Redfield hunting scope sight that incorporates an elongated, "squashed appearance" eyepiece, which by reason of its shape offers the hunter a wider, more useful field of view.

Appropriately named "The Widefield," the new addition to the line of weatherproof Redfield scope sights makes a radical departure from the conventional round eyepiece assembly of hunting scopes.

The wider field of view in the new scope model means the hunter can sight game faster at close range and keep running game in the scope's field of view more easily.

The Redfield "Widefield" will be available with 4-PCCH, 4-Plex, CH Peep, CH, PCH and Dot style aiming reticules, but for the moment can only be had in fixed powers—2-¾X, 4X and 6X. I especially like the 4-PCCH aiming reticule.

Redfield didn't borrow the elongated eyepiece shape from the design of the A&W Shot Charge Diverter, but devoted five years of its own research to the development of the new model scope sight.

A READER ASKS how he can anchor a high power rifle for safe test firing from the end of a long cord tied to the trigger.

For many years, I have found an old automobile tire to be an excellent rest for test firing of questionably safe rifles and shotguns.

Spread the tire's opening sufficiently to wedge butt end of the weapon, the fore-end or barrel resting across the top of the tire on opposite side.

With the rifle or shotgun to be tested in upright, normal firing position (just as it would be if you were firing from shoulder), lash both fore-end and butt stock to the tire to reduce the firearm's "jump" from recoil.

If there is any possibility of the tire casing scratching rifle or shotgun stock, first wrap it in a cloth at contact points before wedging the butt and tying both butt and fore end to the casing.

In improvising the trigger pull cord, do not tie the cord to the trigger, but run the cord through the trigger guard and bring it out opposite side and back over gunstock comb, then tie it to form a large, loose loop that will place equalized pressure on the trigger.

When ready to fire, gently but steadily pull the other end of the cord at a safe distance behind the lashed down weapon.

For maximum safety, lay out the pull cord to full length, but do not slip the loose loop over trigger until weapon is loaded and ready to fire. Then, very carefully slip the loose loop over the trigger and retire to the other end of the stretched cord to apply the necessary trigger pull, which, as already stated must be by gentle increase of cord tension, not by jerking the cord sharply.

AS WITH ANYTHING mechanical, component parts of guns can break or otherwise fail to function most unexpectedly.

Long ago, I learned that it is good practice, and definitely convenient, to keep on hand single units of the most critical parts required to maintain favorite firearms in good mechanical condition, ready to use. From experience, I know that urgently needed gun parts are seldom found locally, and must be factory-ordered.

Mostly, these replacement parts have consisted of firing pins, firing pin springs, extractors, ejectors and—for autoloaders of old Browning patent—recoil springs.

Even so, I was caught unprepared when the firing pin of my Remington Model 58 broke during firing of a round of skeet. I did not have a spare firing pin.

Fortunately, the gun was out of action only a few days. Tom Addison, Kissimmee, Florida, gunsmith, had a replacement firing pin. Prior phone calls to five local area gunsmiths had been fruitless. Had the contact with Addison been the same, I would have had to factory-order the firing pin or get one from Stoeger's stock, experiencing the usual waiting period common to such mail orders.

Every hunter who uses a Springfield or Mauser type bolt-action rifle should keep on hand at least a spare firing pin and spring.

Users of the Marlin 336 big game rifle, and the Marlin 39-A .22, should have extra firing pin and ejector units.

Any humpback model Browning autoloading shotgun (and there are a lot of them in service) more than five years old—as many are—will benefit from replacement of the large, recoil-activated spiral spring. A new one costs only a couple of dollars; installation, along with cleaning and a smoothing rub-down of the tube on which the large spiral spring rides, can make all the difference in the world in smooth, positive mechanical operation.

The old Winchester Model 12, one of the best shotguns ever made, is easy on extractors and ejectors, and usually all you will need to keep on hand are these single small parts, along with an extra firing pin, just in case you may some day need them.

The Remington Model 31 pump-action shotgun, also no longer manufactured, is noted for its reliable action, but may develop mechanical trouble, as all things mechanical eventually do. Firing pin breakage in the Model 31 is a rare occurrence, but an extra ejector should be kept on hand. In fact, it is wise to stockpile a number of the smaller parts. Replacement parts for the discontinued Remington Model 31 are getting scarce.

Owners of Ithaca Model 37 shotguns should have an extra firing pin and extractors readily available.

Old models of Marlin slide-action shotguns are known to be rough on flat spring ejectors and various flat springs, carriers and certain other component parts. Later Marlin shotgun models seem to give less trouble. In the Model 90, part failure usually involves sear, safety and extractor lever.

When I go on a hunt that will keep me away from home for several days, I take along a kit of spare parts that are critical to reliable field functioning. Usually, small parts can be carried in a plastic vial. Long replacement parts are wrapped in oil paper and placed in a small, tough manila clasp envelope, properly labeled with gun model for instant identification among camp duffle.

The moral—if there is one—is to take care of any needed gun repairs or ordering of spare parts *now*, well ahead of the coming hunting season. ●

CONSERVATION SCENE

DDT—The Great Equalizer

THE BUREAU of Sport Fisheries and Wildlife has found DDT or its metabolites in all mallards, black ducks and starlings tested in recent years under the National Pesticides Monitoring Program, reports the National Wildlife Federation.

The pesticide residues found thus far are below levels known to be dangerous to humans, but no one knows what effects they are having on birds. Analysis of more than 24,000 mallard and black duck wings from birds bagged during the 1965 and 1966 hunting seasons, from all over the country, showed DDE to be the predominant residue, followed in order by DDT, DDD, dieldrin and heptachlor epoxide. Dieldrin, a more toxic insecticide than DDT, was found in wings from 30 states. Results from later seasons have not yet been analyzed.

Residues generally were highest in the Atlantic and Pacific Flyways and lowest in the Central Flyway. DDE was notably high in the wings from New Jersey, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Alabama, California and Utah. Dieldrin residues were prevalent in wings from Arkansas, Texas, Utah, California and several Atlantic Flyway states.

Almost 4,000 starlings were collected from 124 sites nationwide during August and September 1967, January and February 1968, and November 1968. Every sample contained dieldrin in addition to DDT and its metabolites. High average residues were found in the Southeast, southern New Mexico, Arizona, California, eastern Utah and the Willamette River drainage of Oregon. Other insecticides detected in starlings were heptachlor epoxide, lindane and BHC.

Generally, DDT and metabolite residue levels in ducks were below one part per million in both adult and immature birds, with a few instances where DDT was greater than two parts per million. Dieldrin averages in ducks rarely exceeded 0.25 parts per million.

But nearly half the starling samples had total DDT greater than one part per million, reflecting the wide distribution and omnivorous feeding habits of this species. Highest readings—21 to 26 parts per million—were found in southern Arizona (where DDT has since been banned). Dieldrin levels in starlings also were greater than in duck wings, although most were below 0.5 parts per million.

Pesticides in Surface Slicks

CONCENTRATIONS of up to 13 parts per billion of chlorinated pesticides were measured in natural surface slicks in Biscayne Bay, Florida, by Dr. Eugene F. Corcoran and Dr. Douglas B. Seba of the University of Miami Rosenstiel School of Marine and Atmospheric Sciences. At the same time, the researchers found that water surrounding the slicks generally contained less than 1 part per trillion—or less than 1/10,000—of the pesticides found in the slicks, announced Dr. F. G. Walton Smith, Dean of the School.

"Natural surface slicks may explain the occurrence of pesticide residues in penguins in the Antarctic, or the disappearance of pelicans from nearly all of the U.S. seacoasts," said Dr. Corcoran. "In Biscayne Bay, for example, we have observed gulls and pelicans diving into surface waters to feed on the dense schools of small fish that feed on plankton concentrated in the slicks. Since these sea birds eat many times their weight in fish, they eventually have more pesticide concentrated in their tissues than the fish did."

"Surface slicks are natural oceanographic phenomena which appear as calm streaks or patches on the otherwise rippled surface of lakes, coastal waters, and open ocean areas," said Dr. Seba. "In our aerial surveys of Biscayne Bay, we have observed slicks varying from a few meters to over 100 meters in width and up to several miles in length. During the summer of 1968, aerial photographs revealed that about 10% of the bay was covered with these slicks."

The slicks may be wind-induced or may occur where two water masses converge. The converging water causes compaction of the film of dissolved organic and inorganic molecules normally found on the surface of biologically productive waters, thereby providing a tremendous supply of nutrients. Some of the nutrients are used directly by phytoplankton (microscopic floating plants); others combine into small particles and are used by filter-feeding animals.

The cycling of pesticides depends not only on food web interactions, but on the interaction between the atmosphere, water, silt, and bottom deposits. In a study with Dr. Joseph M. Prospero, Dr. Seba found that atmospheric dust collected at Barbados, West Indies, after it had crossed 4,000 miles of open ocean, contained appreciable amounts of several chlorinated pesticides. These pesticides were similar to those found in Biscayne Bay surface slicks, and indicate that the Atlantic tropical tradewinds are responsible for transporting significant quantities of pesticides from the continents to the open-ocean ecosystem. The researchers also found pesticides in the rainwater of tropical hurricanes.

This research was supported in part by the Federal Water Pollution Control Administration, the National Science Foundation, and the Office of Naval Research.

"Teddys" Awarded Film Makers

Producers of eight outdoor and travel films have been honored with "Teddy" awards for excellence of their product, the Wildlife Management Institute reports. The awards were named in memory of Theodore Roosevelt, "the first conservation president," and the trophies are shadow boxes with busts of the 26th President.

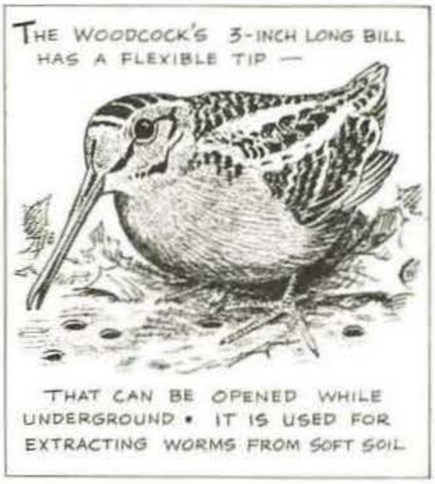
The awards were presented at the program of the seventh annual National Outdoor-Travel Film Festival, sponsored by the Michigan Outdoor Writers Association.

The top awards, best of festival and best outdoor commentary, went to Bill Snyder Films for "Cry of the Marsh," described as a "fascinating and timely documentary film protesting air and water pollution and the effects of encroaching development on our environment."

Other winners: Outdoor travel-recreation (tie for first), "Portraits of the Oregon Coast," Oregon Coast Association and "Winter Potpourri," Ontario Department of Tourism and Information; best outdoor documentary, "The Wetlanders," Ducks Unlimited, Inc.; best fishing film, "Newfoundland World Record Tuna," submitted by Lee Wulff for the American Sportsman; best hunting film, "Washington Black Bear," the American Sportsman, ABC-TV.

"Labrador Retriever," also by American Sportsman, was judged best in the how-to-do-it class, and "Odyssey in White," by Evinrude Motors was judged most unusual outdoor film treatment.

Nature Notes


THE WOODCOCK'S 3-INCH LONG BILL HAS A FLEXIBLE TIP —
THAT CAN BE OPENED WHILE UNDERGROUND • IT IS USED FOR EXTRACTING WORMS FROM SOFT SOIL

Prehistoric Research Findings

Civilization on Marco Island apparently spans the Judeo-Christian era, according to recent archaeological findings and scientific research by the State of Florida.

Possibly at the time that Moses led the Israelites out of Egypt and into the land of Canaan, the pre-Calusa Indians inhabited the sand dunes and higher palm ridges of Marco Island.

Marco Island, 104 miles due west of Miami on the Gulf of Mexico, now represents the southernmost discovery of prehistoric civilization in the United States. Relics and artifacts found here are similar in structure and time period to the St. Johns Indian civilization uncovered in the Jacksonville and Palatka area of northeast Florida, and similar findings in northwest Florida.

The results of three summers of archaeological diggings and explorations on Marco were reported by Florida's State Archaeologist L. Ross Morrell and his research associate, Wilburn A. Cockrell, at a recent meeting of the Collier County Historical Society in the Naples Woman's Club.

Radioactive carbon dating tests on six samples from diggings in the Caxambas region of Marco Island revealed a compute date as early as 1450 B.C. in one test.

"Marco Island is a history in itself," Cockrell pointed out. "We have everything here from modern man back through time, through the Spanish and the Calusa periods into the ceramic era man and possibly even before that. We may find evidence of life on Marco before 1450 B.C."

Working in co-operation with the Marco Island Development Corporation, which is building this planned community 16 miles south of Naples, the archaeologists were aided by funds from the State of Florida, the Collier County Historical Society, and the MIDC.

Starting in 1967, they have spent subsequent summers in their search through shell mounds and other likely areas on Marco Island. At least 15 sites circling Barfield Bay have been dug and examined.

Artifacts collected and tested included pieces of orange fiber tempered pottery with incised decorations. Fiber tempered pottery is the earliest form of clay manufacture and collected pieces of this type span several centuries in time. It preceded sand tempered pottery.

The findings of Indian relics and artifacts more than 3,000 years old were perhaps the most significant discovery of the research on Marco Island. Prior to

(Continued on next page)

Apologies!

For several reasons production and mailing of Florida Wildlife are behind schedule. Please accept our apologies!

(Continued from preceding page) this it was believed human life had existed on Marco Island only since the First Century A.D.

Several pieces of Steatite, a form of soapstone, were found. These probably were trade items brought in by boat or overland from northwest Georgia, the nearest deposit of this type of stone on this continent.

Many early day tools, mostly of shell, were also found.

No human burial mounds were discovered, but one dig revealed the bones of early-day bears.

Morrell reported that the State of Florida archaeology division hopes to continue its work on Marco for a dozen years or so.

He said, "We found possible archaeological sites all over Marco. The island is rich in historic treasure. It is unique. It is the best archaeological find in south Florida."

Great Year for Ducks—and DU

THE YEAR 1969 wound up as tremendous both for ducks and for Ducks Unlimited, North America's pioneering waterfowl conservation organization.

In Canada, the ducks took advantage of the most outstanding habitat conditions in several years to pull off the best production season of the decade. And, with normal snow across the prairies this winter, prospects again look bright for 1970.

Also in Canada, Ducks Unlimited crews during '69 completed a total of 40 new project programs, insuring for the future another 120,000 acres of prime waterfowl breeding habitat.

In the United States, conservation concerned individuals, groups and states made these DU (Canada) construction programs possible by contributing a record total of $2 million to Ducks Unlimited, Inc.

According to the president of the private, non-profit conservation group, William P. Elser of San Diego, the record breaking 1969 DU income represents a healthy 22% increase over previous top year of 1968.

The 40 new project programs completed during '69—17 in Alberta, 12 in Saskatchewan, 4 in Manitoba, 3 in eastern Canada's Maritime Provinces, and 4 interior developments in British Columbia—bring to over 900 the number of "duck factories" constructed by Ducks Unlimited during its 33-year history. Since 1937 DU has built or restored over 1,600,000 acres of nesting habitat, encompassing well over 8,200 miles of productive shoreline.

In commenting on the record-breaking year, DU President William P. Elser paid high tribute to the volunteer DU workers and committees across the country, in these words: "The role of these hard-working conservationists cannot be underestimated—without their tireless efforts, the dollars collected and the projects built just wouldn't have become reality."

The conservation leader also looked to the future, stressing the utmost importance of realizing Ducks Unlimited's sweeping 'Master Plan' for the next decade. Mr. Elser stated: "This dynamic and long-range waterfowl conservation program calls for finally acquiring control of an additional 4,500,000 acres of prime waterfowl wetlands in Canada within the next ten years. If we don't, much of this vital habitat may well be gone down the drain by 1980. The challenge is there—and it's up to us to meet it."

Clean Water Funds Announced

PRESIDENT Nixon has announced his intention to release the full $800 million appropriated by the Congress for construction of waste treatment plants in the current fiscal year, according to the Wildlife Management Institute. This action agrees with a resolution adopted by the President's Federal Water Pollution Control Advisory Board at a recent meeting in Houston, Texas.

The board also asked the President to instruct the Bureau of the Budget to remove its personnel hiring restriction on the Federal Water Pollution Control Administration so that body can employ the additional personnel that will be needed to handle the increased number of grant allocations.

The President's action is being applauded by conservationists throughout the nation who had been urging the expenditure of the full $800 million appropriated by Congress. These same conservationists previously had succeeded in boosting the funds available from $214 million to the $800 million.

The Federal Water Pollution Control Advisory Board also adopted a resolution urging Interior Secretary Walter J. Hickel to endorse a section in the Aviation Facilities Expansion Act which declares a national policy that airport development projects shall provide for protection and enhancement of natural resources and the quality of the environment.

Another resolution requested Congress to act promptly on clearing the Water Quality Improvement Act, which has passed both the Senate and House in differing versions.

Board members re-examined the Houston Ship Channel and the Galveston Bay area, which they last visited two years ago. They toured the coastal region from Port Arthur to Corpus Christi and then heard many witnesses on pollution problems. Conditions they saw and that were described by the witnesses brought expressions of "distress" and "dismay" from the board members. The tour revealed, among other things, that the City of Galveston is dumping 1.5 million gallons of raw sewage per day into Galveston Bay. The State Water Quality Board, after the hearing, moved immediately for a stop order against the city.

For that BIG ONE that

didn't get away

ELIGIBILITY REQUIREMENTS SPECIES	
LARGEMOUTH BASS	8 pounds or larger
CHAIN PICKEREL	4 pounds or larger
BLUEGILL (BREAM)	1 ½ pounds or larger
SHELLCRACKER	2 pounds or larger
BLACK CRAPPIE	2 pounds or larger
RED BREAST	1 pound or larger

All fish must be taken from the fresh waters of the state of Florida, as defined by the Game and Fresh Water Fish Commission. Fish must be caught on conventional fishing tackle, with artificial or live bait, in the presence of at least one witness.

The catch must be weighed and recorded at a fishing camp or tackle store within the state by the owner, manager, or an authorized agent of the respective establishment.

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Only fishing citation applications received within 90 days from date of catch will be honored.

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Please send me the Florida Wildlife Fishing Citation with the inscribed data listed below:

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City________ State________ Zip No.________

Species________ Weight________ Length________

Type of Tackle________

Bait or Lure Used________

Where Caught________ in________ County

Date Caught________ Catch Witnessed By________

Registered, Weighed By________ At________

Signature of Applicant________

CUT OUT AND SAVE THIS APPLICATION BLANK

Osprey (coming into nest)

Photo By Leonard Lee Rue III

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